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EFFECT OF THYMECTOMY ON DRUG REQUIREMENT OF MYASTHENIA GRAVIS PATIENTS

Muhammad Moeen Ahmad, Muhammad Naeem Kasuri and Faheem Saeed

Objective: To determine the effect of thymectomy on the drug requirement of myasthenia gravis.

Methods: Forty patients of myasthenia gravis admitted in Neurology Department Mayo Hospital Lahore were registered. After recording their demographic profile and confirmation of their diagnosis of myasthenia gravis, they were subjected to thymectomy. Their dosages of drugs before thymectomy were recorded and were compared with dosage requirements at 18-30 months post thymectomy.

Results: Thymectomy was done in 34 out of 40 patients. Five patients out of total 40 lost follow up and one was referred to oncology. 34 patients remained for follow up, 30 thymectomized and 4 nonthymectomized. The results indicate a marked reduction in average doses of pyridostigmine (90mg vs 270mg; p<0.001), steroids (7.5mg vs 38mg) and azathioprine (100mg vs 118mg) at 18-30 months after thymectomy as compared to before thymectomy. At 18-30 months of follow up, thymectomized patients were using considerably lesser dosages of pyridostigmine (90mg vs 200mg), steroids (7.5mg vs 30mg) and azathioprine (100mg vs 125mg) as compared to nonthymectomized patients.

Conclusion: The intra-articular NSAIDs injection is a more effective treatment option compared to intra-articular steroid injection for the management of adhesive capsulitis of the shoulder.

Key words: Thymectomy, myasthenia and gravis.

Introduction

Myasthenia gravis (MG) is an autoimmune disorder of neuromuscular transmission associated with a deficiency of acetylcholine receptors. Medical treatment involves the use of anticholinesterase agents, immunosuppressive drugs, plasmapheresis and gammaglobulin, with reported complete clinical remission rates (CCRRs) of only 15%. Thymectomy has become increasingly accepted as an efficacious procedure for myasthenia gravis, with high rates of complete clinical remission, particularly in patients with nonthymomatous disease. A relationship between the thymus and myasthenia gravis was demonstrated in 1901; but it was Blalock et al in 1939 who first demonstrated the beneficial effect of thymectomy, since then thymectomy has become an increasingly accepted procedure in the treatment of myasthenia gravis, as it can achieve complete clinical remission rates as high as 80% in accordance with most of the reports published in the literature. However controversy still persists regarding appropriate selection of patients, the optimal surgical approach, and the extent of mediastinal dissection required.

The purpose of our study was to assess the effects of thymectomy on the course of myasthenia gravis in our part of the world and the decrease in the dosages of various medications used for myasthenia gravis.

Methods

This is a descriptive cross sectional study which was conducted on patients of myasthenia gravis in the Department of Neurology, Mayo Hospital Lahore after permission from ethical review committee. Forty patients were registered for this purpose who got admitted in Neurology Department Mayo Hospital Lahore, and their biodata was recorded. Their clinical evaluation was done to assess the severity of disease. Confirmation of the diagnosis was done by prostigmine test, and repetitive nerve stimulation test performed at the electrophysiology section of Neurology Department, Mayo Hospital Lahore. Additional investigations done in all were thyroid function tests and computed tomography of thorax with contrast. Anti acetylcholine receptor antibodies could be done in only eight patients due to affordability issues. Drug treatment before thymectomy of all patients was recorded with dosages of the medications used. Thymectomy was performed in 34 patients after careful assessment by Thoracic Surgical Department, Mayo Hospital Lahore. For patients who remained in follow up, drug treatment at 18-30 months post-thymectomy was recorded.

Results

Sex Distribution

Out of the 40 patients registered, male were 19 and...
female 21.

**Fig-1:** Sex distribution.

**Investigations**

Thyroid function tests were abnormal in only one patient, whereas CT thorax was abnormal in 4 male and 4 female patients.

<table>
<thead>
<tr>
<th></th>
<th>Thyroid function tests</th>
<th>CT Scan thorax</th>
<th>Anti acetylcholine receptor antibodies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td>n=18 (94%)</td>
<td>n=18 (94%)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>a=1 (6%)</td>
<td>a=4 (21.05%)</td>
<td></td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>n=21 (100%)</td>
<td>n=17 (80.9%)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>a=0 (0%)</td>
<td>a=4 (19.4%)</td>
<td></td>
</tr>
</tbody>
</table>

**Follow Up Status**

Total number of patients registered were 40, out of which thymectomy was not performed in 6 patients and 5 patients left follow up. One patient was referred to oncology. Finally, 34 patients remained for follow up, 30 thymectomized and 4 non-thymectomized.

**Histological findings in operated thymus (34)**

Histological findings revealed thymic hyperplasia in 85.3% and thymoma in 8.8%.

<table>
<thead>
<tr>
<th>Hyperplasia</th>
<th>Thymoma</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Female</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>29 (85.3%)</td>
<td>3 (8.8%)</td>
</tr>
</tbody>
</table>

**Duration of first symptom till thymectomy**

Minimum duration: Three months
Maximum duration: Fifty two months
Average duration: Thirteen months
Mean duration: Twelve months

**Dosages of drugs before thymectomy in forty patients**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Minimum Dose</th>
<th>Maximum Dose</th>
<th>Average Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridostigmine (40)</td>
<td>120mg</td>
<td>720mg</td>
<td>270mg</td>
</tr>
<tr>
<td>Steroids (36)</td>
<td>15mg</td>
<td>60mg</td>
<td>38mg</td>
</tr>
<tr>
<td>Azathioprine (8)</td>
<td>100mg</td>
<td>150mg</td>
<td>118mg</td>
</tr>
</tbody>
</table>

**Dosage of drugs after 18-30 months of thymectomy in thirty patients**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Minimum Dose</th>
<th>Maximum Dose</th>
<th>Average Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridostigmine</td>
<td>30mg</td>
<td>240mg</td>
<td>90mg</td>
</tr>
<tr>
<td>Steroids</td>
<td>0mg</td>
<td>30mg</td>
<td>7.5mg</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>0mg</td>
<td>150mg</td>
<td>100mg</td>
</tr>
</tbody>
</table>

Six patients required no medical treatment after 20-27 months.
More than half of patients were on less than 90mg of pyridostigmine/day.
Six patients were without steroids.
2 patients required only 2.5mg of steroids/day.
10 patients required only 5mg of steroids/day.
No significant reduction in dose of azathioprine except one on 50mg/day and one was free of it.

**Dosage of drugs in non-thymectomized patients after 18-30 months of treatment in four patients**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Minimum Dose</th>
<th>Maximum Dose</th>
<th>Average Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridostigmine</td>
<td>120mg</td>
<td>240mg</td>
<td>200mg</td>
</tr>
<tr>
<td>Steroids</td>
<td>10mg</td>
<td>40mg</td>
<td>30mg</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>100mg</td>
<td>150mg</td>
<td>125mg</td>
</tr>
</tbody>
</table>

**Comparison of dose requirement before and after thymectomy**

In thymectomized patients, there was marked reduction in average doses of pyridostigmine (90mg vs 270mg; p< 0.001), steroids (7.5mg vs 38mg) and azathioprine (100mg vs 118mg) at 18-30 months after thymectomy as compared to before thymectomy.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Before thymectomy</th>
<th>After thymectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridostigmine</td>
<td>270mg</td>
<td>90mg</td>
</tr>
<tr>
<td>Steroids</td>
<td>38mg</td>
<td>7.5mg</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>118mg</td>
<td>100mg</td>
</tr>
</tbody>
</table>
Comparison of dose requirement in non-thymectomized patients at start and after 2 years of treatment

<table>
<thead>
<tr>
<th>Drug</th>
<th>Before thymectomy</th>
<th>After thymectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridostigmine</td>
<td>240mg</td>
<td>200mg</td>
</tr>
<tr>
<td>Steroids</td>
<td>27.5mg</td>
<td>30mg</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>150mg</td>
<td>125mg</td>
</tr>
</tbody>
</table>

Comparison of dose requirement after 18-30 months in thymectomized and non-thymectomized

At 18-30 months of follow up, thymectomized patients were using considerably lesser dosages of pyridostigmine (90mg vs 200mg), steroids (7.5mg vs 30mg) and azathioprine (100mg vs 125mg) as compared to non thymectomized patients.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Before thymectomy</th>
<th>After thymectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyridostigmine</td>
<td>90mg</td>
<td>200mg</td>
</tr>
<tr>
<td>Steroids</td>
<td>7.5mg</td>
<td>30mg</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>100mg</td>
<td>125mg</td>
</tr>
</tbody>
</table>

Discussion
Our study reveals a significant reduction in dose requirement and even full drug freedom within 18-30 months in patients of myasthenia gravis who underwent thymectomy. Out of all, 6 (20%) patients became free of any medications at 20-27 months. This study was one of its unique nature to be conducted in our part of the world and it conclusively proves the positive role of thymectomy in myasthenia gravis in our population as well, where many treating doctors were apprehensive that surgical facilities may not be up to the mark in our region so should treating doctors opt for thymectomy in myasthenia gravis or should they stick to its medical management alone. Our results correlate well with other studies across the world that prove the positive role of thymectomy in treating patients of myasthenia gravis.

Conclusion
A significant reduction in requirement of doses of different drugs noticed in thymectomized patients at 18-30 months post thymectomy. Thymectomy should be considered as an effective and at times curative treatment option for patients of myasthenia gravis.

References
Objective: We aimed to explore the difference of short-term prognosis in controlled, uncontrolled and non-diabetic patients suffering from ischemic stroke.

Methods: This was a prospective observational study conducted at Neurology department of Services Hospital, Lahore over a period of 6 months from January 2014 to June 2014. A total of 113 patients with first-time ischemic stroke (confirmed on CT scan) were admitted in our department. In all patients fasting blood glucose (FBG) level was monitored on 1st admission day and history of Diabetes Mellitis (DM) was acquired. FBG >126mg/dl was taken as cut-off level. In all patients with positive history of DM, HbA1C level was evaluated. So it divided our patients into four groups: A) Uncontrolled Diabetics (HbA1C ≥6.5%, positive history of DM); B) Controlled Diabetics (HbA1C 5.7-6.5%, positive history of DM); C) Impaired glucose group (Deranged FBG, No history of DM); D) Normoglycemics (FBG <126mg/dl, No history of DM). The outcome in all patients was measured in terms of early neurological deterioration (increase in the NIH Stroke Scale (NIHSS) of ≥2 points during the first 14 days after admission) and poor short-term outcome (30-day modified Ranking Scale [mRS] score 2-6) was evaluated.

Results: Of 113 patients, 17 patients were in group A (uncontrolled diabetics), 7 patients were in group B (controlled diabetics), 4 patients were in group C (Impaired glucose group) and 85 patients (75.2%) were in group D (Normoglycemics). All the groups were comparable regarding demographic details. The risk of early neurological deterioration was higher in group A (9/17 patients) (ORs=1.839; 95% CI, 0.707-4.782), than group B (3/7 patients) (ORs=1.48; 95% CI, 0.35-6.31), group C (1/4 patients) (ORs=0.868; 95% CI, 0.091-8.238), and group D (19/85 patients). Similarly the risk of poor short-term outcome was also significantly higher in the group A (13/17 patients) (ORs=2.75; 95% CI, 0.83-8.238; p=0.047) than group B (5/7 patients) (ORs=2.12; 95% CI, 0.389-11.54; p=0.207), group C (2/4 patients) (ORs=0.847; 95% CI, 0.114-6.301; p=0.440), and group D (46/85 patients).

Conclusion: In our study population, patients having hyperglycemia with history of DM were associated with poor short-term prognosis than those with normal glycemic readings after ischemic stroke.

Key words: stroke; ischemic; outcome; diabetes mellitis; diabetics.

Introduction

Stroke is a leading cause of death in adult population following cardiac diseases and is responsible for about 9% of total deaths each year. Also it contributes as a major cause in long-term morbidity among survivors, as about 40% of the sufferers don’t get independent in their future life. According to estimation by World Health Organization (WHO), about 15 million people suffer from stroke per year worldwide. Diabetes is an established risk factor for the development of stroke. In a study by Doi Y and colleagues, The Hisayama study, the risk of stroke in general Japanese population was found twice higher in diabetics than non-diabetics. Also outcome after stroke was worse in diabetics than non-diabetics. Previous studies have demonstrated residual neurological deficits and functional outcome to be worse in diabetics as compared with nondiabetics. Therefore, hospital and long-term mortality were worse in diabetic patients than nondiabetics, although a few other studies did not confirm these effects. A few studies have compared the difference in outcome between controlled, uncontrolled and non-diabetic patients. Therefore, we planned this study to explore the difference of short-term prognosis in controlled, uncontrolled and non-diabetic patients suffering from ischemic stroke.

Methods

After approval from hospital ethical review board, this study was planned. It was a Descriptive
observational study conducted at department of neurology, Services Institute of Medical Sciences (SIMS), Services hospital, Lahore over a period of one year, from January, 2014 to December, 2014. All the patients with first time ischemic stroke (confirmed by CT scan) presenting in emergency department were included in the study. Those having subarachnoid hemorrhage and venous etiology of stroke on CT scan brain and previous history of stroke were excluded from the study. Also those patients who died within 30 days after stroke were excluded. Written informed consent for inclusion in the study was acquired from all the patients. In all patients fasting blood glucose (FBG) level was monitored on 1st admission day and history of Diabetes Mellitis (DM) was acquired. FBG >126mg/dl was taken as cut-off level. In all patients with positive history of DM, HbA1C level was was evaluated. So it divided our patients into four groups: A) Uncontrolled Diabetics (HbA1C ≥6.5%, positive history of DM); B) Controlled Diabetics (HbA1C 5.7-6.5%, positive history of DM); C) Impaired glucose group (Deranged FBG, No history of DM); D) Normoglycemics (FBG <126mg/dl, No history of DM). All the patients were assessed at 1st admission day as per the NIH Stroke Scale (NIHSS). They were managed as per policy of the department and after discharge they were followed up at 14th and 30th post-stroke day. At 14th day they were assessed again by NIHSS. At 30th day they were assessed by modified Ranking Scale (mRS). The outcome in all the patients was measured in terms of early neurological deterioration (if there was increase in the NIHSS of ≥2 points during the first 14 days after admission) and short-term outcome (30day mRS score). Short-term outcome was labelled as poor if it was between 2-6.

The collected data was entered and analyzed accordingly using SPSS version 21 through its statistical program. The variables were analyzed using simple descriptive statistics, calculating mean and standard deviation for numerical values like age. Frequencies and percentages were calculated for qualitative variables like gender and scores in all groups (using NIHSS and mRS scale). The Odd's Ratio (OR) and 95% confidence interval (95% CI) for outcomes were determined in all stroke patients in each group.

Results
A total of 113 patients were included in the study. Of these 113 patients, 17 patients were in group A, 7 patients were in group B, 4 patients were in group C and 85 patients (75.2%) were in group D. All the groups were comparable regarding demographic details (Table 1).

Of all the included patients, 24 patients (21.2%) had previous history of DM and 70.8% of them were having uncontrolled DM while remaining 29.2% had controlled DM. Four patients in the study had first time deranged FBG and 2 of them later on were labelled as diabetics after full evaluation.

The percentage of patients developing early neurologic disability was higher in group A than others (group A: 52.9%; group B:42.8%; group C: 25%; group D: 22.3%). OR was calculated for each group which is summarized in Table 2. Similarly poor short-term outcome was noted and it was highest among group A patients than others (group A: 76.4%; group B: 71.4%; group C: 50%; group D: 54.1%). or for each group is summarized in Table

### Table-1: Demographic details of the patients in four groups.

<table>
<thead>
<tr>
<th></th>
<th>Group A (n=17)</th>
<th>Group B (n=7)</th>
<th>Group C (n=4)</th>
<th>Group D (n=85)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean in years)</td>
<td>55.7±10.34</td>
<td>59.5±9.97</td>
<td>56.7±16.21</td>
<td>57.0±14.5</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>4</td>
<td>3</td>
<td>49</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>12</td>
<td>5</td>
<td>5</td>
<td>69</td>
</tr>
<tr>
<td>Middle</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>High</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Hypertension</td>
<td>13</td>
<td>5</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Ischemic Heart Disease</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>Current cigarette smokers</td>
<td>10</td>
<td>4</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>
Discussion
It has been mentioned in many clinical trials that admission hyperglycemia is an indicator of extensive brain damage which ultimately leads to rise in stress hormones leading to hyperglycemia. However, animal studies have shown that administration of insulin is associated with better outcome after stroke. It suggest that hyperglycemia post-stroke is not just a response to stress, rather it is of pathophysiological significance. Admission hyperglycemia is a well-known and established predictor of poor outcome after ischemic stroke. In a study it was found that diabetic patients have a 2 fold higher relative risk of mortality after ischemic stroke within 30 days. Although there is minimal data available in the literature regarding the optimal cut-off level of random blood sugar during treatment, however American stroke association recommended glucose level of <300mg/dl to be targeted. Zsuga and colleagues conducted a trial in patients with ischemic stroke and they found that even a mild rise in glucose levels in these patients is an independent predictor of 30-days mortality. In our study 24 of 113 patients (21.2%) were known patients of DM. In a large study conducted in Chinese population, Fang Y and colleagues had found DM in 23% of the general population presenting with ischemic stroke. In another study by Cruz- and colleagues, DM was found in 24.2% of all the patients with ischemic stroke. For early neurologic deterioration we used NIHS scale which is a commonly used scale at all centers. We found the worst outcome in known diabetics while outcome was relatively better in those having controlled diabetes. In a large The Fukuoka Stroke Registry, it was found that pre-stroke glycemic control is important and a significant independent factor for better outcome in stroke patients. In another study, it was found that early neurological deterioration was more in diabetics than non-diabetic patients. These findings are in accordance to our results. There are several reasons for poor functional outcome in diabetics than non-diabetics. In an animal study conducted on mice, it was found that there was release of higher inflammatory response after stroke and also higher neuroprotective heat-shock chaperone gene attenuation. Also DM induces the release of metalloproteases which ultimately leads to increased permeability of blood brain barrier and greater inflammatory response, thus resulting in poor outcome after stroke. These factors support our results of poor outcome in diabetics than non-diabetics.

Also short-term outcome was poor in diabetics than non-diabetics. In our study, 4 patients had deranged FBD who were not previously known diabetics and out of these 4, 2 patients later on turned out to be diabetics. Tanaka et al found that pre-diabetics and patients with underlying hyperglycemia also suffer from longer hyperglycemic states and thus have poor outcome. Other than glycemic control, some other factors are also there playing their role in the outcome of stroke patients. Toyoda and co-workers found that in patients with poor glycemic control, blood pressure was significantly higher than those having better controls. Therefore, blood pressure level in stroke patients is associated with the outcome. Also Zhou J and colleagues found that when hyperglycemia was associated with raised levels of markers of inflammation, the ultimate outcome was poor in patients with stroke.

Our study had several limitations. Firstly it was a short-term outcome study and no long-term outcome was analyzed. It had limited sample size as it was a single center study. Therefore we suggest a multicenter study with longer duration to unravel long-term outcomes in diabetic patients presenting with stroke.

### Table-1: Demographic details of the patients in four groups.

<table>
<thead>
<tr>
<th></th>
<th>Early Neurological Deterioration</th>
<th>% age of Pts.</th>
<th>Odd's Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>Yes</td>
<td>9/17</td>
<td>ORs=1.839; 95% CI, 0.707-4.782</td>
</tr>
<tr>
<td>Group B</td>
<td>Yes</td>
<td>3/7</td>
<td>ORs=1.48; 95% CI, 0.35-6.31</td>
</tr>
<tr>
<td>Group C</td>
<td>Yes</td>
<td>1/4</td>
<td>ORs=0.868; 95% CI, 0.091-8.238</td>
</tr>
<tr>
<td>Group D</td>
<td>Yes</td>
<td>19/85</td>
<td>ORs=0.332; 95% CI, 0.134-0.817</td>
</tr>
</tbody>
</table>

### Table-1: Demographic details of the patients in four groups.

<table>
<thead>
<tr>
<th></th>
<th>Short-Term Poor Outcome</th>
<th>% age of Pts.</th>
<th>Odd's Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>Yes</td>
<td>13/17</td>
<td>ORs=2.75; 95% CI, 0.83-8.238; p=0.047</td>
</tr>
<tr>
<td>Group B</td>
<td>Yes</td>
<td>5/7</td>
<td>ORs=2.12; 95% CI, 0.385-11.54; p=0.207</td>
</tr>
<tr>
<td>Group C</td>
<td>Yes</td>
<td>2/4</td>
<td>ORs=0.847; 95% CI, 0.114-6.301; p=0.440</td>
</tr>
<tr>
<td>Group D</td>
<td>Yes</td>
<td>46/85</td>
<td>ORs=0.412; 95% CI, 0.158-1.079; p=0.348</td>
</tr>
</tbody>
</table>

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References

12. The Fukuoka Stroke Registry.
Objective: Our aim of study was to determine early and late outcomes of CABG in patients with poor left ventricular function. The CABG surgery is beneficial in patients who have poor left ventricular function manifested by an ejection fraction 30% or even less. These are the high risk patients but CABG surgery not only promote their survival but also improve their functional status. They are easy victims of increased operative mortality and diminished long term survival.

Methods: In our study we identified 63 patients who underwent CABG surgery despite poor LV function. Data was collected during their follow up visits or telephonic follow up conducted by us. We used pre op. IABP in 2(3.17%) patients. Among these 63 patients 36(57.14%) were documented as healthy and Stable, 9(14.29%) were expired during follow up and in 18(28.57%) follow up was not continued because 4(6.35%) have no contact numbers and 14(22.22%) phones were switched off. The average duration from 2008 to 2015 was taken to be 42.5 months approximately. Each patient necessarily received atleast one IMA. : The surgical strategy included approach through median sternotomy. All cases were started as off-pump CABG. Elective conversion to on-pump CABG was done for cases not tolerating off-pump.

Results: In this retrospective study we have analyzed the early and late outcomes of CABG in low EF group. Main findings of the study are an acceptable hospital mortality i.e. mortality rate among patients with EF <30% is 1.59% at our tertiary care center However, post-surgery complications prevailed.3 (4.7%) patients encountered deep wound infection and same ratio suffered renal failure. We observed the early outcomes i.e. in hospital mortality evaluated to be 1.58%. These results reflect improving results of surgery in this high risk group.

Conclusion: Our study demonstrated that all of our patients received atleast one arterial graft i.e. internal mammary artery. The minimum standard set by STS is that atleast 95% of the patients must receive internal mammary artery. This contributes to the survival benefit of the patients and also improves the quality of life and reduces reoperation rates. In this retrospective study we have analyzed the outcome of CABG in low EF group. Main findings of the study are an acceptable hospital mortality. We concluded that acceptable morbidity and mortality rates prevailed among this high risk group at our tertiary care center. We believe that improvements in cardiac anesthesia, surgical technique, extracorporeal perfusion, perioperative care and postoperative management have contributed significantly to better outcomes.

Keywords: Poor ejection fraction, CABG, Left ventricular dysfunction, Early and late outcomes, IMA, Median sternotomy.
Ejection fraction (LVEF) is the measurement of how much blood is being pumped out of the left ventricle of the heart (the main pumping chamber) with each contraction. A single retrospective study has been done in Pakistan. Unfortunately, little is known with respect to long-term survival and its predictors in this patient population. Here, we report our clinical experience in a contemporary single-center series of patients with severely depressed LV function who underwent CABG from 2008 to 2015. In present study we sought to determine the early outcome and predictors of early mortality as well as late mortality in this patient population. Furthermore, we performed a subgroup analysis comparing conventional CABG with off-pump CABG.

**Methods**

The definition of low EF or impaired ventricular function is an EF of less than or equal to 30% as assessed by 2D and color echo. Retrospective analysis of pre-operative, operative and post-operative data of patients with EF less than or equal to 30% undergoing first time isolated CABG at our institution from 2008 to 2015. Data was collected during their follow up visits or telephonic follow up conducted by us. We included the patients who underwent first time elective or urgent isolated CABG with an EF of 30% or less. Those undergoing an emergency procedure or in cardiogenic shock pre-operatively, redo surgery or having combined valvular and CABG operations were excluded. All pre-operative, intra-operative and post-operative variables were taken from STS data base maintained for every cardiac patient, this includes telephonic interviews at one month through 7 years post-surgery so all the data is reliable. Additional information was taken from patient's record files, if required. In our study to we monitor the patient health and condition which also included hospital mortality and follow up. The maximum duration of which is being 7 year after surgery. EURO II score was used for risk stratification of patients. Emergency procedures were situations requiring immediate surgical intervention like cardiogenic shock, ongoing ST segment changes and failed or complicated PCI. Urgent procedures were situations where surgery was required as a priority during next few days e.g. left vain stenosis, unstable angina requiring IV nitrates or heparin.

**Surgical Strategy:** The surgical strategy included approach through median sternotomy. All cases were started as off-pump CABG. Elective conversion to on-pump CABG was done for cases not tolerating off-pump CABG. After completion of surgery patients were shifted to CICU with inotropic supports or IABP. After the removal of inotropic supports/IABP, patients were assessed and shifted out of ICU. Patients were discharged from the hospital after satisfactory rehabilitation.

**Results**

63 Poor LV patients in which CABG was performed were studied. Data was collected during their follow up visits or telephonic follow up conducted by us. The average months of whole data will be 42.5 months from 2008 to 2015. We observed the early outcome i.e. in hospital mortality which was evaluated to be 1.58%. However, post surgery complications prevailed. 3 (4.7%) patients encountered deep wound infection and same ratio suffered renal failure. We used IABP in 2 (3.17%) patients. According to STS, renal failure may be taken as increased serum creatinine up to double after CABG surgery although it returns to normal before discharge. Deep wound infection is defined as infection of incision that either involves muscles/tissues and is culture positive.

![Fig-1: Early outcomes after CABG.](image1)

![Fig-2: Distribution of patients according to followup](image2)
Among these 63 patients 36 (57.14%) were documented as healthy and Stable, 9 (14.29%) were expired during follow up and in 18 (28.57%) follow up was not continued because 4 (6.35%) have no contact numbers and 14 (22.22%) phones were switched off (Figure 1).

On-Pump CABG was performed in 34 (53.97%) patients and OPCAB in 29 (46.03%). Among On-Pump CABG 15 (44.12%) were diabetic and same frequency we observed with Hypertension whereas 13 (38.24%) were smokers. In OPCAB 12 (41.38%) were diabetic, 11 (37.93%) were hypertensive, 19 (65.52%) were smokers (Figure 3).

Discussion
Patients with CAD and advanced ventricular dysfunction have poor prognoses with medical treatment alone despite recent advances. The Coronary Artery Surgery Study (CASS) demonstrated the late outcomes of cabg surgery that only 38% of medically treated patients (EF <35%) were alive and free of moderate or severe limitations 5 years after the onset of treatment. Surgical approaches to CAD patients with low EF include CABG, ventricular remodeling, and cardiac transplantation. Lucani et al., reported an 82% 5-year actuarial post-transplant survival rate in patients with ischemic heart disease and a left ventricular EF <0.30. However cardiac transplantation is not available in Pakistan. Studies evaluating ventricular reconstruction are currently underway, and this option may become an attractive alternative treatment in the near future. Our study has demonstrated that the mortality rate among patients with EF <30% was 1.59%.

Similarly, in considering the early outcomes, the New York State database claims early mortality of patients with EF ≤20% to be 4 times higher than patients with EF>40% (4.6% versus 1.0%). Carr et al., have shown an 11% perioperative death rate in patients with EF between 10% and 20%. More recently, 4% inhospital mortality rate has been reported in patients with EF <30% [14]. However, the observed 1.59% early mortality rate is lower than those reported in many major studies of isolated CABG in patients with low EF. However, post-surgery complications prevailed. 3 (4.7%) patients encountered deep wound infection and same ratio suffered renal failure. We used IABP in 2 (3.17%) patients. These mortality rates decline over time. We believe that improvements in cardiac anesthesia, surgical technique, extracorporeal perfusion, perioperative care and postoperative management have contributed significantly to better outcomes.

Conclusion
Our study demonstrated that all of our patients received at least one arterial graft i.e. internal mammary artery. The minimum standard set by STS is that at least 95% of the patients must receive internal mammary artery. This contributes to the survival benefit of the patients and also improves the quality of life and reduces reoperation rates. In this retrospective study we have analyzed the outcome of CABG in low EF group. Main findings of the study are an acceptable hospital mortality. These results reflect improving results of surgery in this high risk group.

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References


**HOST HAEMATOLOGICAL INDICES: POTENTIAL DIAGNOSTIC MARKERS IN PLASMODIUM VIVAX MALARIA**

Mubashir Razzaq Khan, Faria Malik and Tariq Zulfiqar

**Objective:**
1. To identify the fluorescent signal patterns on WBC histograms in flowcytometry based, five parts differential haematology analyzers, in smear positive cases.
2. To make a diagnostic algorithm based on haematological parameters and WBC scattergrams in suspicious cases of P vivax malaria.

**Methods:**
Seventy smear positive Plasmodium vivax haematological indices on automated 5 part differential hematology analyzers (XE2100 & XE5000) were checked for seminal use as potential diagnostic markers.

**Results:**
Seventy smear positive Plasmodium vivax malaria cases were selected. Haematological indices revealed that 83.4% had thrombocytopenia. Pseudoeosinophilia was seen in 76.4% cases with 51/68 showing more than 5% gap. Considerable anaemia (Hb <10 g/dl) was exhibited by 32.8% of the patients. Leukopenia was seen only in 11 cases. Monocytosis was seen in 30 patients.

**Conclusion:**
CBC run on automated analyzers gives information in the form of an integrated pattern of results. When thrombocytopenia along with raised MPV & PDW, anemia, leukopenia, monocytosis, eosinophilia (Pseudoeosinophilia in actual), abnormalities of WBC scatter-grams, monocytosis and altered RDW are read in collaboration lead to strong suspicion of P vivax malaria infestation.

**Keywords:** Plasmodium vivax malaria, automated hematology analyzers, hematology scatter grams, thrombocytopenia, pseudoeosinophilia, monocytosis

**Introduction**
Malaria is caused by the bite of female Anopheles mosquito, transmitting a protozoan, namely, Plasmodium. Four species of plasmodium cause malaria in humans: Plasmodium vivax (P vivax), Plasmodium falciparum, Plasmodium ovale, and Plasmodium malariae. In 2013, there were an estimated 584000 malaria deaths worldwide (95% uncertainty interval, 367 000755 000). Pakistan falls in range of 10-49 deaths per 100,000 of population. About 80% of estimated malaria cases in 2013 occurred in just 18 countries and 80% of deaths in 16 countries. For P vivax cases, three countries (India, Indonesia, and Pakistan) accounted for more than 80% of estimated cases. The global burden of mortality and morbidity was dominated by countries in sub-Saharan Africa. Usual presentation of the individuals with malaria is fever, chills, sweating, headache, vomiting, diarrhea, abdominal pain and distension, cough splenomegaly and hepatomegaly. General work up of malaria includes blood counts, peripheral smear for malaria, urine examination, liver and renal function tests, CSF analysis, and immunochromatography for malarial antibodies depending upon the clinical history of the patient. Other more specialized techniques involve ELISA for malarial antibodies, detection of malarial DNA by PCR, histological detection on biopsies, and detection of malarial LDH by Gel Agglutination technique.

Globally malaria is responsible for a lot of mortality (5,84000 in 2013) and morbidity(198 million cases in 2013). It is most prevalent in rural tropical areas below elevations of 1000 m (3282 ft). P vivax is distributed widely but it causes less morbidity and mortality. Anemia in malaria is usually caused by hemolysis due to direct invasion of red cells, anemia of chronic disease, hypersplenism, hemophagocytic syndrome and erythrophagocytosis, dyserythropoiesis, immune hemolysis and cytokine dysregulation. Thrombocytopenia is mainly due to direct infection of platelets and increased sequestration in the presence of palpable splenomegaly and circulating immune complexes. Disseminated intravascular coagulation may also contribute in some cases towards severe thrombocytopenia. Hematological manifestations of Plasmodium Vivax infection include thrombocytopenia, anemia, leukopenia, leukocytosis, alterations in platelet indices (Mean Platelet Volume-
MPV, and Platelet distribution width-PDW), monocytosis, pseudoeosinophilia, abnormal scatterograms on hematology analyzers (neutrophils outside limit, neutrophils inferior deviation, neutrophils right deviation, eosinophils outside limit, confluent neutrophils and eosinophils, granulocytes outside inferior limit, two or more neutrophils coded groups or eosinophils groups, tendency of granulocytes to form one group, abnormal (grey) granulocytes color), and altered Random Distribution Width-RDW.

Methods
This is a retrospective, cross sectional, descriptive study. Seventy cases of Plasmodium vivax, positive on peripheral blood film, were included in this study. Sample with deranged LFTs and RFTs were excluded from the study.

Methods used to diagnose malaria involved peripheral film, both thick and thin blood smear. CBC was performed on Sysmex XE2100, Sysmex XE5000 instruments. These instruments use highly sophisticated technology using RF/DC Detection Method, Hydro Dynamic Focusing (DC Detection), Flow Cytometry Method Using Semiconductor Laser, and SLS-Hemoglobin Method.

Results
Majority patients i.e. 84.3% (n=59/70) showed thrombocytopenia with mean platelet count of 95.7 x10^9/L ranging from 18 to 333 x10^9/L. Pseudoeosinophilia was noted in 77.1% patients (n=54/70) with a gap of 0.8-25.1% between the analyzers' reported eosinophils and actual percentage on smear. Other findings are summarized in the following table-1.

WBC scatter-grams showed by hematology analyzers exhibit different patterns (eosinophils outside limit, merged dots of neutrophils and eosinophils, granulocytes outside inferior limit, equal to or more than two eosinophil coded areas, and abnormal (grey) granulocyte color).

**Table-1:** MPV (Mean Platelet Volume), PDW-C (Platelet Distribution Width-Coefficient of Variation) MCV (Mean Corpuscular Volume of RBCs), RDW (Random Distribution Width-Coefficient of Variation of RBCs), WBCs (Total White Blood Cells). MPV and PDW were not reported by analyzers in 45 patients out of 70. RDW-CV was not calculated in only one patient.

<table>
<thead>
<tr>
<th>Parameters</th>
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<th>Range</th>
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<td>Platelets (x10^9/L)</td>
<td>70</td>
<td>95.7</td>
<td>18-333</td>
</tr>
<tr>
<td>MPV (fL)</td>
<td>45</td>
<td>10.6</td>
<td>8.6-13</td>
</tr>
<tr>
<td>PDW-C (fL)</td>
<td>45</td>
<td>13.2</td>
<td>8.3-19.8</td>
</tr>
<tr>
<td>Hemoglobin (g/dL)</td>
<td>70</td>
<td>11.3</td>
<td>4.1-16</td>
</tr>
<tr>
<td>MCV (fL)</td>
<td>70</td>
<td>87.2</td>
<td>6-128</td>
</tr>
<tr>
<td>RDW-CV (fL)</td>
<td>69</td>
<td>18.1</td>
<td>13.83.1</td>
</tr>
<tr>
<td>WBCs (x10^9/L)</td>
<td>70</td>
<td>7.28</td>
<td>21-22.9</td>
</tr>
<tr>
<td>Monocytes (%)</td>
<td>70</td>
<td>10.1</td>
<td>1-30</td>
</tr>
</tbody>
</table>

**Fig-1:** P vivax on smear shows trophozoite (a), gametocyte (b), and schiznot (c) stages

**Fig-2:** Eosinophils outside limit (a), equal to or more than two eosinophil coded areas (b), merged dots of neutrophils and eosinophils (c&d), granulocytes outside inferior limit (d&e), and abnormal (grey) granulocyte color (d&f).
Discussion
Malaria has been a major threat to human health for centuries in terms of morbidity and mortality. In the present study, thrombocytopenia was one of the leading hematological abnormality in 84.3% (n=59/70) patients with *P. vivax* malaria. In this study, the patients with alteration in MPV and PDW were 12.7% (n=7) and 37.8% (n=17), respectively, out of 45 patients. In 15 patients, these two parameters were not measurable. Considerable anemia (Hemoglobin <10 g/dL) was found in 32.8% (n=23) of the patients. However, in our study, some patients showed microcytosis & hypochromia 22% (n=14) and macrocytosis 22% (n=14), favoring nutritional causes of anemia. A wide range of total WBCs was seen between 2.1-22.9 x 10^9/L and mean of 7.3x10^9/L. Malaria could also be associated with Leukopenia (11%, n=8 in our study). Pseudoeosinophilia is a striking finding on modern hematology analyzers. This is a phenomenon, in which eosinophils reported by analyzers are much different from actual eosinophils (both percentage and absolute number). In our work, 76.4% of the patients (n=52/68) showed pseudoeosinophilia. In two patients, this gap was not measurable. The gap between pseudo- and actual eosinophils ranged between 0.3 and 25.1 with a mean of 6.67%, in 52/68 patients. A gap of more than 5% between reported eosinophilia and actual eosinophils is significant. In our work we found 51.4% (n=35/68) of the total patients showed pseudo eosinophilia more than 5%. Monocytosis is attributed towards active phagocytosis of the parasite by monocytes (mean monocyte percentage of 10.6% with a range of 1 to 30% with 42.8% (n=30) patients showing monocytosis in our work).

Another finding in our record is Altered RDW with a mean of 18.1 N= 11-14 (range 13-38.1 fL). In our study, WBC scatter-grams showed by hematology analyzers were (eosinophils outside limit, merged dots of neutrophils and eosinophils, granulocytes outside inferior limit, equal to or more than two eosinophil coded areas, and abnormal (grey) granulocyte color).

Conclusion
To conclude: we suspect *P. vivax* malaria when CBC, run on automated analyzers, gives information in the form of an integrated pattern of results. When thrombocytopenia along with raised MPV & PDW, anemia, leukopenia, monocytosis, eosinophilia (Pseudoeosinophilia in actual), abnormalities of WBC scatter-grams, Monocytosis and altered RDW are read in collaboration, gives a strong suspicion of *P. vivax* infestation. Further diagnostic tests are to be run such as Thick and Thin Blood Smears, Immune Chromatography, PCR for DNA detection, Malarial LDH detection by Gel Agglutination for work up of malaria.

Hematology. Demonstrator Department of Pathology SIMS, Lahore.

www.esculapio.pk

References
11. Huh HJ, Oh GY, Huh JW, Chae SL. Malaria detection with the Sysmex XE-2100 hematology analyzer using pseudoeosinophilia.
Benzodiazepines are a class of sedatives that includes Xanax, Valium and Klonopin. Although the Centers for Disease Control and Prevention have focused on opioids in the wake of the worsening drug epidemic in the US, results from a new study place benzodiazepines center stage in this epidemic.

During the 18-year study period, the benzodiazepine overdose death rate increased four-fold, prompting researchers to call for interventions to reduce use. Published in the American Journal of Public Health, the study was conducted by researchers at Albert Einstein College of Medicine and the Montefiore Health System in New York, as well as the Perelman School of Medicine at the University of Pennsylvania.

Patients are prescribed benzodiazepines for conditions such as anxiety, mood disorders and insomnia; in the US each year, an estimated 1 in 20 adults fill a prescription for a benzodiazepine. These sedatives are considered a safe and effective treatment, but their long-term use can lead to addiction. Furthermore, there are certain side effects attached to them, including daytime drowsiness and a "hung-over feeling," increasing risk of automobile accidents. They can also make breathing problems worse and can lead to falls in the elderly.

When used with alcohol, benzodiazepines can be dangerous, and overdoses can be serious. In 2013, overdoses from the class of drugs made up 31% of the 23,000 prescription drug overdose deaths in the US. However, little was known about benzodiazepine prescribing trends or fatalities.

To further investigate, the researchers, led by Dr. Marcus Bachhuber, looked at data from 1996-2013, using the Medical Expenditure Panel Survey and multiple-cause-of-death data from the Centers for Disease Control and Prevention (CDC).

They found that the number of adults who filled a benzodiazepine prescription increased by 67% during the study period, which spanned 18 years; it went from 8.1 million prescriptions in 1996 to 13.5 million in 2013.

And for those adults who filled a prescription, the average quantity that was filled during each year more than doubled from 1996-2013. Furthermore, the overdose rate increased four-fold, from 0.58 deaths per 100,000 adults in 1996 to 3.14 deaths per 100,000 adults in 2013.

"We found that the death rate from overdoses involving benzodiazepines, also known as 'benzos,' has increased more than four-fold since 1996 - a public health problem that has gone under the radar," says Dr. Bachhuber.

Senior study author Dr. Joanna Starrels says there may be two possible reasons for the increase in benzodiazepine deaths. Firstly, those "at risk for fatal overdose may be obtaining diverted benzodiazepines," meaning they are obtaining them from sources other than medical providers.

Another reason is that using benzodiazepines with alcohol or drugs puts people at greater risk for fatal overdoses. She says opioids are involved in 75% of overdose deaths that involve benzodiazepines.

** Courtesy: medical news today **
Introduction
The electroencephalogram (EEG) which is entirely harmless and relatively inexpensive, is the most important investigation in the diagnosis and management of epilepsies providing that it is properly performed by experienced technicians and carefully studied and interpreted in the context of a well-described clinical setting by experienced physicians. More than one-half of children and adults currently referred for a routine EEG are suspected of suffering from or do suffer from epilepsies. The EEG is indispensable in the correct syndromic diagnosis of these patients. American Clinical Neurophysiology Society guidelines require a minimum of 20 minutes of artifact-free recording for routine EEGs. Studies have shown that the greatest yield of interictal abnormalities during video EEG monitoring are found within the first 24 hours of recording. However, the ideal length of time for routine EEGs has not clearly been established. Because sleep is known to activate interictal epileptiform activity, it is important to determine if lengthening the record duration from 20 to 40 minutes increases the likelihood of obtaining sleep.

Methods
The present study was conducted at Services Institute of Medical Sciences and Services Hospital, Lahore, Pakistan. This prospective study was carried out in 2012 and included 171 patients who were admitted with the primary diagnosis of Epilepsy. All the patients were between 15-30 years of age. Patients Having other co-morbidities were excluded from this study. We studied 150 consecutive and sequential
EEGs with a duration of 40 minutes, performed. All EEGs were digital and performed using the standard 10-20 electrode placement. The following data were obtained: age of the patient; time at which the EEG was recorded, before or after noon; presence of EEG abnormalities within the first 10 minutes of recording; presence of EEG abnormalities captured exclusively in the second 10 minutes of recording; presence or absence of sleep; latency to sleep onset; and presence of abnormalities during sleep. All EEGs were read by certified electroencephalographer. Participants gave written informed consent after the purpose of the study had been explained to them. The ethics committee of the hospital approved the study.

Statistical analyses
An independent sample t test was done to assess the correlation between whether sleep was achieved and the age of the patient. Abnormalities were defined as epileptiform sharp-wave or spike-wave activity or any areas of abnormal slowing. The statistical packages SPSS (Version 20) and MS Excel (MS Office 2010) were used.

Results
A total of 171 patients fulfilling the inclusion criteria were enrolled to measure whether a routine EEG of 20 minutes yields more information than a 10-minute EEG in capturing epileptiform abnormalities and in obtaining sleep. A total of 171 routine EEGs of 20 minutes' duration were reviewed. The age range of these patients was 16-29 years. Out of 171, 108 patients (63%) were males while 63 patients (37%) were females (Table 1).

In our study, 117 EEGs (68%) were identified as abnormal. Of the 117 abnormal EEGs, 73 (62%) were abnormal within 11 to 20 minutes of recording and remaining 44 (38%) showed abnormalities out of this range (Fig-1).

Table-1: Gender distribution of all patients included in this study.

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>108</td>
<td>63%</td>
</tr>
<tr>
<td>Female</td>
<td>63</td>
<td>37%</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100%</td>
</tr>
</tbody>
</table>

Discussion
It is well known that the likelihood of finding interictal abnormalities is directly proportional to the length of the EEG recording. However, in our current health care environment, testing such as EEG should be both cost effective and time efficient. Capturing sleep is one of the ways in which the yield of an EEG can be improved. This brings to mind the question of what should be the ideal length of time for a routine EEG. Narayanan et al. found that 37% of their epilepsy patients aged 10 years or older had epileptiform activity in the first 20 minutes. In Taiwan, Lee et al. studied the latency to first epileptiform discharge in 863 EEG recordings of varying duration and found that 64% occurred within the first 30 minutes of recording. Reardon et al. from Australia analyzed 420 25-minute EEGs and compared interictal epileptic discharges in the first 15 minutes versus the next 10 minutes. They found that the 15-minute recordings failed to record abnormalities in 6.3% (8/128) of their population. This was very similar to a recent study from the United Kingdom by Agbenu et al. which analyzed 297 pediatric EEGs of 20 minutes duration and compared the first 10 minutes of the record with the subsequent recording. Of the 109 abnormal EEGs (37%), 17 patients (16%) showed an abnormality seen only in the last 10 minutes of the record, and of these 7 (6.42%) were abnormal only in the last 5 minutes. These results are interesting to compare with our study, which showed abnormalities in 68%, and similar to the preceding studies in that the majority (62%) of studies had abnormalities within the first 11-20 minutes.

Reardon et al. and Agbenu et al. both make the case for reducing EEG recording time below 20 minutes. Potential benefits include the ability to perform more
EEGs in the same amount of time as well as reducing the length of time required for the child to cooperate with the procedure and possibly reducing the cost of the study. Reducing the length of EEG recordings can also lighten the burden of physician reading time, allowing opportunities to read more EEGs or attend to other patient care responsibilities.

**Conclusion**
Our study suggests that the majority of abnormalities on routine EEG are seen within the 11-20 minutes of recording however increasing EEG duration may significantly increases the yield. Obtaining sleep increases the yield of epileptiform activity. Abnormalities detected with an EEG recording of 20 minutes can minimize the need for long-term recordings, leading to more economical and time-efficient care. The conclusion of this study is that a routine EEG of 20 minutes optimizes the likelihood of capturing both awake and sleep states while still being cost-effective.

**References**

Objective: To determine the frequency of depression in patients with migraine coming to Services Hospital, Lahore.

Methods: One hundred and fifty cases fulfilling the inclusion/exclusion criteria were enrolled in the study and informed consent was taken, regarding inclusion of patient in study. All patients after confirmation of migraine with consultant having at least 5 years of experience of consultancy, depression were evaluated by the researchers themselves.

Results: Frequency of depression in patients with migraine coming to services hospital, Lahore was recorded in 48% (n=72) while 52% (n=78) had no findings of the morbidity.

Conclusion: We concluded that the frequency of depression is high among patients with migraine. So, it is recommended that every patient who present with migraine, should be sort out for psychological disturbance.

Key words: Migraine, depression, frequency

Introduction
Migraine is chronic paroxysmal disorder characterized by stereotypical attacks of headache, focal neurological symptoms or a combination of both. It is one of the most burdensome of the primary headache disorders. It affects as many as 18% of women and 6% of men aged 25-55 years and is under-recognized worldwide. In addition it results in enormous expense to society. In United States, the direct and indirect costs of migraine are estimated to be more than 20 billion dollars annually.

Migraine is associated with higher than expected incidences of several neurological and psychiatric disorders, including epilepsy, stroke, depression, bipolar disorder, and anxiety disorders. Migraine also appears to be associated with irritable bowel syndrome, mitral valve prolapse, asthma, chronic fatigue syndrome, low-tension glaucoma, and Raynaud phenomenon. The association between migraine and depression is well established, but the mechanism is uncertain. Depression may mean the symptom of feeling sad, melancholic or low in spirit, or it may mean the syndrome of depression as characterized by low mood, lack of enjoyment, reduced energy and changes in appetite, sleep and libido loss. Many effective treatments are available for major depressive disorder, including psychotherapy (e.g. cognitive-behavioral, interpersonal, or expressive), used either alone or in combination with medication. However, the combined approach provides some patients with the quickest and most sustained response. Uncomplicated depression that is not severe typically responds equally well to psychotherapy or an antidepressant. Rationale of this study is to determine the frequency of depression in patients with migraine coming to Services Hospital, Lahore and also help to treat the co-morbidity well in time.

Methods
One hundred and fifty cases having age B/w 20-60 of both genders were enrolled in the study and informed consent was taken, regarding inclusion of patient in study. All patients after confirmation of migraine with consultant having at least 5 years of experience of consultancy, depression were evaluated by the researcher himself. Already diagnosed patients with depression or already taking any antidepressant medication and patient not willing to participate were excluded.

Results
In our study, we recorded age of the patients, where 56% (n=84) were between 20-40 years, 44% (n=66).

Table-1: Age distribution (n=150).

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>No. of Patients</th>
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<tr>
<td>20-40</td>
<td>84</td>
<td>56%</td>
</tr>
<tr>
<td>41-60</td>
<td>66</td>
<td>44%</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100%</td>
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</table>

Mean+sd: 38.99+9.21
were between 41-60 years, Gender distribution of the patients shows 62%(n=93) were male and 38%(n=57) were female. Duration of illness was recorded, it shows that 42.67%(n=64) were between 1-6 months and 57.33%(n=86) had >6 months of duration. Frequency of depression in patients with migraine coming to services hospital, Lahore was recorded in 48%(n=72) while 52%(n=78) had no findings of the morbidity. Stratification for age with regards to depression in migraine shows that out of 72 cases of depression 41 were between 20-40 years and 31 were between 41-60 years of age, p value was computed as 0.82 which is not significant.

Table-2: Sex distribution(n=150).

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>93</td>
<td>62%</td>
</tr>
<tr>
<td>Female</td>
<td>57</td>
<td>38%</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table-3: Duration of Illness (n=150)

<table>
<thead>
<tr>
<th>Duration of Illness in(months)</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6</td>
<td>64</td>
<td>42.62%</td>
</tr>
<tr>
<td>&gt; 6</td>
<td>86</td>
<td>57.33%</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100%</td>
</tr>
</tbody>
</table>

Mean±sd: 6.31±2.73

Table-4: Frequency of depression in patients with migraine presenting to Services Hospital Lahore(n=150)

<table>
<thead>
<tr>
<th>Duration of Illness in(months)</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>72</td>
<td>48%</td>
</tr>
<tr>
<td>No</td>
<td>78</td>
<td>52%</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100%</td>
</tr>
</tbody>
</table>

Discussion

Several studies have reported significant associations between migraine, affective disorders and anxiety disorders. Two of the most important were longitudinal epidemiological studies of young adult populations using standardized operational criteria for the diagnosis of both migraine and psychiatric disorder. Merikangas et al found elevated 1-year prevalence rates for a wide range of psychiatric disorders in people with migraine ('migraineurs') compared with 'non-migraineurs', and reported odds ratios of 2.2 (95% CI 1.14.8) for major depressive disorder. In addition, Breslau et al found that lifetime prevalence rates of dysthymia, major depressive disorder, bipolar affective disorder, generalized anxiety disorder, panic disorder and phobia were significantly elevated among people with migraine compared with non-migraineur controls. The findings of our study are in agreement with Hamirani M recorded frequency of Anxiety and Depression among patients with Migraine in 58.6% while another local study by Shehbaz N reveals 40% of the patients having migraine with depression.

Conclusion

We concluded that the frequency of depression is high among patients with migraine. So, it is recommended that every patient who present with migraine, should be sort out for psychological disturbance. However, it is also required that every setup should have their surveillance in order to know the frequency of the problem.

References


**Picture Quiz**

**WHAT IS DIAGNOSIS?**

See Answer on page #44
Objective: To determine the association of low serum zinc levels with multiple viral warts.

Methods: Comparative case control study was conducted from 28th February 2011 to 28th August 2011 in Department of Dermatology, Services Hospital, Lahore. 110 cases; 55 in each group calculated with 80% power of test, 5% level of significance and taking expected percentage of low serum zinc level i.e. 56% in patients presenting with warts, 32% in control group. Serum zinc analysis was carried out by atomic absorption spectrometry.

Results: Age of patients as well as of controls ranged from 12-65 years with a mean of 30.02 + 10.04 years. Serum zinc level was low in 33 (60%) patients and 19 (34.5%) controls. Among the patients, serum zinc level ranged from 680 - 1020 microgram/litre with a mean of 812.33 + 105.57, whereas level ranged from 687-1020 microgram/litre with a mean of 848.96 + 113.68 among controls. Odds ratio was 2.84.

Conclusion: As the Odds ratio is 2.84 (>2) it concludes that there is an association between the low serum zinc level and multiple viral warts. So, low serum zinc level is a risk factor of the multiple viral warts.

Key words: Zinc, multiple warts, human papillomavirus.
duration of 3-12 months and age and gender matched controls (attendants and relatives of patients) were selected. The patients with chronic dermatological or systemic disorders (already diagnosed cases of diabetes mellitus, chronic liver disease), taking zinc supplements, immune deficiency congenital or acquired (on systemic steroids or immunosuppressants), pregnant and lactating females were excluded from the study. An informed consent was obtained for conducting the study and using their data for research purpose. A special questionnaire was completed through an interview and data were collected for analysis such as demographic characteristics (age, sex), number, type and duration of warts.

5ml of blood sample was taken from patients as well as controls after history and examination. Serum zinc analysis was carried out by atomic absorption spectrometry. Serum zinc level < 800µg/L was taken as low. Data was entered and results were analysed statistically using SPSS 12. Descriptive statistics were calculated. Mean and standard deviations were calculated for continuous variables i.e. age. Frequency and percentage were calculated for low serum zinc level and gender in both groups. Odds ratio (OR) was calculated for the association of low serum zinc level and multiple viral warts. OR >2 was considered as significant.

Results
Fifty five patients and an equal number of age and gender matched healthy controls were recruited in the study who fulfilled the inclusion and exclusion criteria.

While considering the descriptive statistic, age of the patients as well as the controls ranged from 12-65 years with a mean of 30.02±10.04 years. Most of the studied population (n=69, 62.7%) was in the age group 21-30 years.

In both studied groups 38 (69.1%) were males and 17 (30.9%) were females. Plantar warts (n = 28,50.9%) were the most common presentation followed by common warts (n = 13, 23.6%), filiform warts (n = 8,14.5%) whereas genital warts (n= 06, 10.9%) were the least common. Among patients, the serum zinc level ranged from 680-1020 microgram / litre with a mean of 812.33 + 105.57 whereas the level ranged from 687-1020 microgram/litre with a mean of 848.96 + 113.68 microgram/litre among controls. The serum zinc level was low in 33 (60%) patients and 19 (34.5%) controls (Table 1, 2). Odds ratio (OR) for the association of low serum zinc levels with multiple viral warts was found to be 2.84 which is statistically significant as it is >2 (Table 3).

Table-1: Patients with low serum zinc Level.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Zinc Level of cases</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Percent</td>
<td>Valid Percent</td>
</tr>
<tr>
<td>Low serum zinc</td>
<td>33</td>
<td>60.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Valid</td>
<td>Normal ser zinc</td>
<td>22</td>
<td>40.0</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table-2: Patients with low serum zinc Level.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Zinc Level of controls</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Percent</td>
<td>Valid Percent</td>
</tr>
<tr>
<td>Low serum zinc</td>
<td>19</td>
<td>34.5</td>
<td>34.5</td>
</tr>
<tr>
<td>Valid</td>
<td>Normal ser zinc</td>
<td>36</td>
<td>65.5</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table-3: Association between low serum zinc level and multiple viral warts.

<table>
<thead>
<tr>
<th>Risk Estimate</th>
<th>Value</th>
<th>V95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odds ratio zinc level (low serum zinc/normal) serum zinc</td>
<td>2.842</td>
<td>1.310</td>
</tr>
<tr>
<td>For cohort Warts = Yes</td>
<td>1.673</td>
<td>1.134</td>
</tr>
<tr>
<td>For cohort Warts = No</td>
<td>.589</td>
<td>.390</td>
</tr>
<tr>
<td></td>
<td>.888</td>
<td>.6166</td>
</tr>
</tbody>
</table>
Discussion

Warts are a common dermatological problem in our society. These are small tumors of the skin and other epithelial surfaces caused by a virus called the human papillomavirus. Their appearance can differ depending on the type and location on the body. Most cases occur between ages 12-16 years. Despite viral immune evasion, the immune system effectively clears most HPV infections, which resolve without any medical intervention. It is basically the cell-mediated immunity that plays a role in regressing viral warts. However, sometimes, the infection remains persistent, progressive or recurrent, probably because of some defect in immunity against the virus.

Deficiency of zinc is said to have an adverse effect on cell-mediated immunity. It has been suggested that it affects mainly the functions of Th1 cells. Even a mild deficiency in humans may be accompanied by an imbalance of Th1 and Th2 cells, decreased serum thymulin activity, decreased recruitment of T naive cells, a decreased percentage of T cytolytic cells, and decreased NK cell lytic activity. It is crucial to the normal development of immune cells, and it plays an important role in maintaining the activity of a range of immune cells, including neutrophils, monocytes, B and T cells, natural killer cells, and macrophages.

The use of immune modulation as a treatment of viral warts is a relatively newer concept. Zinc sulphate has been used successfully for the treatment of viral warts. It has been stated that local irritation which is produced by topical zinc application may trigger immune response. However, it may be due to replacement of zinc deficiency or by immunomodulatory functions of the zinc. The possibility that low serum zinc level may lead to an increased risk of acquiring warts may be evident as one study showed that all the lesions regressed completely in conjunction with the increment of serum zinc.

In our study mean age of patients and healthy controls was 30.02±10.045 while age range was 12-65 years. Most of the patients and controls were in the age group 21-30 years (n=69, 62.7%). In the previous study done by Raza and Khan sample size was large, 75 patients with the similar inclusion criteria for age were included in the study. Mean age and standard deviation in this study was 25.8±8.90 years.

This shows that despite differences in sample size of two studies mean age is not very far away from each other. In our study 69.1% were males and 30.9% were females in both studied groups. In the study conducted by Raza and Khan 69.3% were males and 30.7% were females. In a similar study conducted by Shahbaz, et al. in Iran 47% were males in both studied groups.

This observation shows that there was slightly more male predominance in our and other studies. This could be due to easy approach of males to health facilities due to cultural reasons.

Significant difference in serum zinc concentration was found between the two groups in our study. 34.5% healthy controls and 60% patients having viral warts had serum zinc levels below the normal range which clearly indicates that although a considerable proportion of our population is deficient in zinc, this deficiency is present in a higher number of patients with multiple viral warts as the difference was statistically significant (odds ratio = 2.84). Our results are consistent with other studies such as 56% of patients with viral warts and 32% healthy controls had low serum zinc levels in a study by Raza and Khan.

The serum zinc level of patients in our study was 680-1020 microgram/litre with a mean of 812.33±105.57. In a similar study by Raza and Khan serum zinc level of patients with viral warts ranged from 695-1090 microgram/litre with a mean of 804.38±100.60 was statistically lower than the level of serum zinc in the healthy control group 690-1100 microgram/litre with a mean of 836±91.04, whereas Yaghoobi, et al reported a mean serum zinc level of 550.9±100.7 micro-gram/litre in patients with recalcitrant multiple viral warts. Also in another study by Al-Gurairi, et al mean serum zinc level of all patients with viral warts 625±100.7 microgram/litre was significantly lower than at baseline in comparison with the level of serum zinc in healthy controls 878±100 microgram/litre.

Although mean serum zinc levels in patients in these studies were lower, this difference may be due to different standards or techniques used or because of other nutritional deficiencies. An estimation of serum zinc levels by the photometric method is less accurate whereas an estimation by atomic absorption, the method we employed in this study, is a fairly accurate method for estimation of metals including zinc.

Numerous studies have shown the relationship of zinc deficiency with infections and the benefits of zinc with respect to these diseases in human. A study has revealed that viral warts completely disappeared in more than 78.1% of the patients treated with oral zinc sulphate for 2 months.
Zinc deficiency was found in 60% of the patients in our study; the remaining patients had serum zinc levels within normal limits. This finding probably suggests that factors other than serum zinc deficiency like other nutritional deficiencies may also be operative in immunity failure against clearance and development of multiple viral warts.

**Conclusion**
The present concludes that there is an association between the low serum zinc level and multiple viral warts. So, low serum zinc level can be considered a risk factor for the multiple viral warts.

**References**
Sarcasm of Quality and Efficiency: An Evaluation of Pediatrics Inpatient Bed Utilization in Services Hospital, Lahore, Pakistan

Muhammad Ashraf Majrooh, Najam ud Din, Muhammad Naeem, Saeed Ahmed Khan, Muhammad Tauseef Javed, Waqar Butt, and Jumana Fatima

Objective: To determine inpatient bed utilization in the Pediatrics Ward of Services Hospital, Lahore as average daily census and Bed Occupancy Rate.

Methods: A cross sectional study was conducted in the Pediatrics Medicine Ward of Services Hospital Lahore which is a tertiary care hospital attached with Services Institute of Medical Sciences Lahore, Pakistan. A 'midnight census' was conducted by 4th year MBBS, Medical Students for the children admitted from 6 to 12 May, 2015. The data for inpatient service utilization was analyzed for estimation of average daily census and bed occupancy rate.

Results: The average daily census was 69 patients per day and the Bed Occupancy Rate was found to be 137.7%. This rate was higher than 100% that shows the over- utilization of beds leading to quality compromise for the provided services.

Conclusion: High bed occupancy rate indicates a scarcity of beds in the Pediatric Ward which highlights a disparity between the supply and demands of pediatric medical services. A change in policy and increase in number of beds would help provision of quality health services to the children.

Key words: Average Daily Census, Bed Occupancy Rate, inpatient service utilization, cross-sectional study, Services Hospital, Pediatrics,

Introduction

Bed occupancy rates have been proposed to reflect the ability of a hospital to provide safe and efficient patient care but it always remains the dilemma between the quality and efficiency of health services generally in developing countries where there is scarcity of the resources. In order to accommodate the large number of patients in a limited capacity inpatient wards the quality of care is often compromised. The Daily Inpatient Census is usually carried out at mid-night because at this time there is least reshuffling and changeover of the patients. The census consists of the number inpatients present at official census taking time (mid-night) each day and this also includes the patients admitted and discharged on the same day. The Average Daily Census is the average number of inpatients treated during a given period of time. The general formula for computing the Average Daily Census is:

\[
\text{Average Daily Census} = \frac{\text{Total number of inpatients treated}}{\text{Number of days in the same period}}
\]

In a research study in Denmark, the National Health Database consisting of 322 departments of 72 hospitals was analyzed for bed occupancy and infection rates. It was found that there was 9 percent increase in hospital mortality and thirty-day mortality rates with high bed occupancy rates in the two million admissions from 1995 to 2012 in Denmark. A study in Honolulu also concluded the significant quantifiable negative influence of high hospital bed occupancy on Emergency Department (ED) throughput affecting both hospitalized and discharged patients. There were increases in the odds of either a patient leaving without being seen (odds ratio 1.21; 95% CI 1.12 to 1.31) or being treated in a hallway bed (odds ratio 1.18; 95% CI 1.15 to 1.22).

High bed occupancy rates not only affect the patient care but also negatively affect the health care providers. An article published in The American Journal of Psychiatry published in November 2008 revealed that an average increase of 10% bed occupancy in excess of the recommended limit for 6 months was associated with use of new antidepressant treatment among the health care provider staff. The pattern of association was dose response so that increase in bed occupancy was associated with increased likelihood of the use of antidepressants. So it was concluded in the study that overcrowding in hospital wards may have an adverse effect on the mental health of staff.

In Brazil, a hospital assessment tool was initially developed and field-tested with involvement of local professionals and concurrent assessment and
planning of identified improvements as average daily Census of children was made. This tool was the prototype for subsequent hospital pediatric department assessments in countries such as Cambodia, Indonesia, Kazakhstan, Kenya, Solomon Islands and Timor Leste, where the findings were the basis for initiating pediatrics department improvement activities.\textsuperscript{6} The hospital with a high average occupancy rate may not necessarily be running more efficiently than the hospital with a low average rate. Hospitals with bed occupancy rates of above 85 percent are generally considered to have bed shortages. Little attention has been paid to the impact of these shortages on patients' outcomes. The availability of beds is perhaps the single most important factor in determination of the hospital utilization in a country. This overcrowding of the pediatric ward in hospitals is a major managerial and medical problem, common to the whole world and every country is equally affected with it.\textsuperscript{7}

In 2006, a US based retrospective study was done over 39 freestanding, tertiary-care children's hospitals participating in the Pediatric Health Information System (PHIS) to know the relation between acute response and the bed occupancy of the pediatric hospitals. The results revealed that as a whole, PHIS hospitals were often at high occupancy (70\% of all midnights above 85\% occupancy and 42\% of midnights above 95\%). The patient safety, quality, and efficiency were adversely impacted by occupancy above 8590\%. The systems functioned well until 8590\% of capacity is utilized. Up to that point, service-delivery is maximized while allowing for natural fluctuations in patient volume. Above that point, “rejections” and delays mount, indicating a decreased acute response with high BOR.\textsuperscript{8} As very high bed occupancy rates affect the patient care & the staff, the low bed occupancy has its own implications. In Crain's analysis (2015), it was revealed that the American State of Chicago is facing the plague of empty beds. According to report, pediatrics had the biggest decline of falling 8 percent in the six-county area. Only 92 of the state’s 213 hospitals staff pediatric beds and the median occupancy rate was 20 percent, reflecting years of declining birthrates. Although, the median in the six-county area was higher i.e. 25 percent but 17 hospitals had rates under 20 percent. St. Bernard Hospital in Englewood was the lowest, with only 3 percent of its pediatric BOR.\textsuperscript{9} Pediatric medicine is in an initial stage in Pakistan as in other developing countries. Indeed, there is a great need of pediatricians to be trained in the care of critically ill or injured child in order to reduce the mortality rate. The beginning has been made but there is still long way to go. This field is full of opportunity and dynamism. Motivation and dedication towards providing care to ill children is the most important part in the development of pediatric medicine.

The rationale of the study was to find out the Bed Occupancy Rate in the Pediatric Ward of Services Hospital, Lahore.

**Methods**

A Cross sectional study was conducted in Services Hospital Lahore from 6 May, 2015 to 12 May, 2015 in Pediatric Medicine Ward. This is a tertiary care hospital having a 50 bedded Pediatrics Medical Unit attached with Services Institute of Medical Sciences Lahore, Pakistan. The study proposal was developed by the 4th Year Medical Students in the Department of Community Medicine Services Hospital Lahore under the supervision of the Head of the Department. A data collection tool was objectively developed and pre-tested in the Pediatrics Medical Ward. A data collection team consisting of 4th Year Medical Students was organized and trained for the data collection. Data collection team conducted midnight census of the Pediatrics Ward for inpatient services utilization from 6 to 12 May, 2015. Data was compiled by using Microsoft Excel.
Worksheet and it was analyzed using formulas for Average Daily Census and Bed Occupancy Rate. For Discussion

Diabetes mellitus is perhaps the fastest growing metabolic disorder in the world. As the condition
Calculation of the daily census, number of patients admitted, number of patients admitted and discharged/LAMA and number of patients admitted and died on same day were added. Then, the number of patients previously admitted and discharged/LAMA and number of deaths were subtracted from that sum. The daily inpatient census report is given in table below. The average daily census was computed by dividing the total number of inpatient service days estimated by daily census in a given period of time divided by number days during the same period.  

\[
\text{Average Daily Census} = \frac{N}{D}
\]

Where

\( C \) = Average Daily Census
\( N \) = Number of inpatient service days
\( D \) = Number of days

Bed Occupancy Rate (BOR) was calculated by using formula:  

\[
\text{BOR} = \left( \frac{\text{Total number of inpatient service days for a given period}}{\text{Available beds} \times \text{Number of days in the period}} \right) \times 100
\]

Results:
The results are presented as total inpatient service days, average daily census and the Bed Occupancy Rates. The total inpatient service days estimated by daily census were 482. The average daily census estimated was 69 patient days. The Bed Occupancy rate as estimated by using reference formula was found to be 137.7% which was marked above the recommended standards of 80 to 85%.

Fig-1: Trends in Bed Occupancy Rate at Pediatric Ward of Services Hospital, Lahore for one week period.

Discussion

Measurement of patient flow performance is an emerging field of research. We carried out the midnight census of Children admitted daily in the Pediatric Ward of Services Hospital, Lahore for consecutive seven days by using a Performa as a data collection tool. The average daily census was 69 and BOR was 137.7% showing that there are 100 beds for every 137 children admitted in pediatric medicine ward of services hospital Lahore.A graph was plotted taking days at x-axis and BOR on y-axis to show the trends in BOR in Pediatric Ward of Services Hospital, Lahore during the 7-day period. It showed consistent high BORs (i.e. > 135%), with a peak of 148% on Saturday. The peak rise at weekends is indicative of the increased patient influx from suburbs and rural areas. It is indicative of overburdening because the basic health units and tehsil headquarter hospitals around Lahore are not fully functional and people don’t prefer to avail health services in BHUs and THQs which ultimately lead to the increased patient influx in tertiary care level hospitals.

Bed Occupancy Rate (BOR) in a hospital is a sensitive indicator to assess the health care utilization of any hospital. It not only reflects changes in the service provided by any hospital but also provide necessary data of seasonal variations. It is of prime importance to remove the hospital bottlenecks which in turn reduces length of stay of in-patients. Over burdening of hospitals is a global issue, affecting even the Big Nations. In developed countries like United Kingdom and United States BOR is 88% and 90% respectively.6 The Denmark has the hospitals struck with very high Bed Occupancy Rate of 100%. Bed occupancy rates above a safe threshold are associated with delays in admissions, which may divert resources from other processes in any department of hospital. Bed shortages might not result simply from a miss-match between supply and demand but might also involve factors such as a flawed approach in planning budgeting and leadership. There must be a self regulating mechanism that keeps occupancy rate around 80%-85% which may lead to relief of the physicians and the hospital staff.

The level of average whole hospital occupancy should not be the ultimate goal but rather what occupancy is appropriate to a bed pool of this particular size and function? The true challenge is to staff the patients rather than beds and to find out the supporting tools required to achieve this goal. Attempts to save both capital (and implied staff) costs may be seen in their true light and the full extent of the unanticipated consequences for staff and patients may be appreciated.  

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**Conclusion**

Bed occupancy rate of Pediatric ward of Services Hospital Lahore in our study is 137.7%, which indicates that there are 100 beds available for 137 children. This reflects that the inpatient services are not sufficient to meet the pediatric disease burden of the population. Moreover, the district referrals are not catering pediatric inpatient services leading to overburden to tertiary care facility. Hence it is recommended that the proportionate strengthening of the Pediatric inpatient services at tertiary care and peripheral district levels may be ensured. The recurring stress on capacity of pediatric medicine ward of services hospital Lahore has direct implications for disaster surge capacity. To cope with it, sanctioned number of beds should be increased as per WHO criteria.

*Department of Community Medicine  
SIMS/Services Hospital, Lahore  
www.esculapio.pk*

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**References**


Introduction

Stroke is a clinical syndrome characterized by rapidly developing symptoms and/or signs of focal and at times global (for patients in coma) loss of cerebral functions, with symptoms lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin. According to World Health Organization report 2002, total mortality due to stroke in Pakistan was 78512. By 2020, stroke mortality will have almost doubled. Increased body temperature markedly exacerbates neuronal injury in experimental models of cerebral ischemia. An association between increased body temperature and poor outcome has been shown in patients with acute stroke. However, the temporal profile of this relation is not well established. Several prospective studies found that high body temperature on admission was associated with poor outcome. Others found that an increased body temperature within the first days after stroke onset was a prognostic factor for unfavorable outcome. Body temperature is an important topic in ischemic stroke. As hypothermia is considered a robust neuro protectant and has shown efficiency against a variety of brain injuries at an experimental level, the influence of body temperature and hypothermia on ischemic stroke is of great interest. A recent study showed that low body temperature on admission was associated with persistent proximal middle cerebral artery occlusion. These results may support a possible detrimental effect of low body temperature on clot lysis and recanalization. Admission body temperature, 36.5°C was independently associated with persistent middle cerebral artery occlusion when adjusted for confounders in multivariate analyses (odds ratio 3.7, P = 0.007). A study suggests that low body temperature within 6 hours of symptom onset is associated with severe ischemic stroke. Linear regression showed that low body temperature on admission was independently associated with a high NIHSS (National Institute of Health Stroke Scale) score within 6 hours of stroke onset in patients with ischemic stroke. The correlation between NIHSS score and body temperature on admission was r = -0.17 (P<0.001). A pilot study done on 30 patients of ischemic strokes with rectal temperature less than 97.8 of presenting in emergency of Lahore general hospital, Lahore, found that 18 (60%) had severe stroke with mean NIHSS score 30, 6 (20%) had moderate to severe stroke with mean NIHSS score 18, 4 (13%) had moderate stroke with mean NIHSS score 10. This study was planned to determine correlation between severity of ischemic stroke and body temperature in patients on admission in tertiary care hospital. This may help to provide new observational data to become clearer that...
Hypothermia also cause poor ischemic stroke outcome as does hyperthermia thus stressing on keeping the ischemic stroke patients euthermic.

**Methods**

This descriptive cross sectional study was conducted in Department of Medicine, PGMI/Lahore General Hospital, Lahore, during a period of six months from 1st July 2014 to 30th December 2014 in Ameer-Uddin Medical Collage. The calculated sample size was 220 cases with 5% type I error and 10% type 2 error taking an expected correlation as 0.175 between NIHSS score and body temperature. Non probability consecutive sampling technique was used for recruiting patients.

All patients of either gender, age ≥ 30 years diagnosed as ischemic stroke i.e. patients presenting with focal neurological deficit (weakening of any part of the body) for more than 24 hours in whom CT scan brain showed a hypodense area corresponding to the clinical picture were considered eligible for the study [7]. Exclusion criteria were patients developing stroke due to other reasons like tumors, meningitis, vasculitis; patients with history of intervention or surgery i.e. end arterectomy or patients who received any antipyretic, water sponging or intravenous fluids before temperature recording.

Two hundred and twenty cases fulfilling inclusion and exclusion criteria were included in study. Informed consent was taken from patient or first degree relative. Demographic history including age and sex was taken. CT scan brain was done to diagnose ischemic stroke. Rectal temperature of all patients was measured and recorded with rectal thermometer. The National Institute of Health Stroke Scale (NIHSS) was used to assess stroke severity on admission. National Institute of Health Stroke Scale (NIHSS) scoring was done (Table I), [8]. The NIHSS is both reliable and valid, and has become a standard stroke impairment scale for use in both clinical trials and as part of clinical care in the United States. Data were entered and analyzed on SPSS version 21.0 software program. The qualitative variables like gender (male or female), body temperature (low, normal or high) and severity of ischemic stroke (no stroke symptoms, minor stroke, moderate stroke, moderate to severe stroke, severe stroke) were presented as frequency and percentages. Quantitative data like age (in years), NIHSS score and body temperature were presented as mean and standard deviation. Pearson’s correlation test was applied to determine the correlation between severity of ischemic stroke and body temperature. Mean age was compared using independent sample t test while post stratification chi square test was used. P value ≤ 0.05 was taken as significant.

**Results:**

220 diagnosed patients of ischemic stroke, with mean age 55 ± 3.424 years and age ranging from 39 to 60 years were included in the study. Out of 220 patients, 141 (64.1%) were male patients with ischemic stroke and 79 (35.9%) were females. Body temperature of sampled population in Fahrenheit ranged from 95-102°F while mean temperature was 98.18 ± 2.014. NIHSS Score of sampled population was 14 to 30 with mean score 23.90 ± 4.139 standard deviation (Table II). Figure 1 shows the relationship between body temperature on admission within 6 hours of stroke onset in patients with ischemic stroke and their corresponding NIHSS scores. When we correlated the body temperature with NIHSS stroke severity score, Pearson correlation was significant at given sample size and value of r came out -0.528 (Table II).

<table>
<thead>
<tr>
<th>Table-I: National institute of health stroke scale.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
<td><strong>Score</strong></td>
</tr>
<tr>
<td>1.a. Level of consciousness</td>
<td>Alert 0</td>
</tr>
<tr>
<td></td>
<td>Drowsy 1</td>
</tr>
<tr>
<td></td>
<td>Comatose 2</td>
</tr>
<tr>
<td>1.b. LOC questions</td>
<td>Answers both correctly 0</td>
</tr>
<tr>
<td></td>
<td>Answers one correctly 1</td>
</tr>
<tr>
<td></td>
<td>Incorrect 2</td>
</tr>
<tr>
<td>2. Pupillary response</td>
<td>Both Reactive 0</td>
</tr>
<tr>
<td></td>
<td>One reactive 1</td>
</tr>
<tr>
<td></td>
<td>Neither reactive 2</td>
</tr>
<tr>
<td>3. Best gaze</td>
<td>Normal 0</td>
</tr>
<tr>
<td></td>
<td>Partial gaze palsy 1</td>
</tr>
<tr>
<td></td>
<td>Forced deviation 2</td>
</tr>
<tr>
<td>4. Best visual</td>
<td>No visual loss 0</td>
</tr>
<tr>
<td></td>
<td>Partial hemianopia 1</td>
</tr>
<tr>
<td></td>
<td>Complete Hemianopia 2</td>
</tr>
<tr>
<td>5. Facial palsy</td>
<td>Normal 0</td>
</tr>
</tbody>
</table>
Increased body temperature markedly exacerbates neuronal injury in experimental models of cerebral ischemia. An association between increased body temperature and poor outcome has also been shown in patients with acute stroke. As hypothermia is considered a robust neuroprotectant and has shown efficiency against a variety of brain injuries at an experimental level, the influence of body temperature and hypothermia is of great interest. In the present study, mean age of presentation was 55 ± 3.424 years ranging from 39 to 60 years showing involvement of cerebral arteries at an earlier age quite different from age in western countries. More preventive measures need to be taken to reduce the incidence of stroke in our population which is currently suffering double burden of disease i.e. both infectious and noninfectious. Out of 220 patients, 141(64.1%) were...
male patients with ischemic stroke while only 79 (35.9%) were females showing estrogen protection even after menopause. Mean body temperature of sampled population was 98.18 ± 2.014°F. NIHSS score of sampled population was 14 to 30 with mean score 23.90 ± 4.139. Correlation of the body temperature with NIHSS stroke severity score, showed significant Pearson correlation coefficient (r=-0.528) at given sample size (n=220), (P<0.05). These results emphasize on the maintenance of body temperature immediately after stroke. Acute exonal injury leads to disturbed body temperature regulations or vice versa. Patients with stroke need proper ambient temperature so we may reduce the subsequent morbidity.

These results are supported by similar local and international studies. A pilot study done on 30 patients of ischemic strokes with rectal temperature <97.8°F presenting in emergency of Lahore General Hospital, Lahore had found that 18 (60%) suffered severe stroke with mean NIHSS score 30, 6 (20%) suffered moderate stroke with mean NIHSS score 18, 4 (13%) had mild stroke with mean NIHSS score 10. Blanco et al. prospectively studied 2931 consecutive patients, 2468 with ischemic stroke and 463 with intracerebral hemorrhage, and recorded temperature at admission and then at 24, 48 and 72 hours after admission. Temperature in stroke patients was found higher than in controls, and increased gradually in the first 72 hours after stroke. A positive correlation between temperature and stroke severity determined by NIHSS was found at 24 and 48 hours. A high temperature was associated with poor outcome at 24 hours (OR 2.05, 95% CI 1.59-2.64, p<0.0001) and 48 hours (OR 1.93, 95% CI 1.08-2.34, p=0.007), but not at admission or 72 hours.

They concluded that temperature increased in stroke patients in the first 72 hours, with the deleterious effect of high temperature occurring in the first 48 hours and the neuroprotective effect of low temperature occurred within the first 24 hours from stroke onset. Similarly, Millán et al. studied 254 patients treated with intravenous tissue plasminogen activator (tPA) within 3 hours of stroke onset and recorded NIHSS score, body temperature, and transcranial Doppler ultrasound (n = 99) on admission and at 24 hours. They found that body temperature ≥37°C at 24 hours, but not at baseline, was associated with a lack of recanalization, greater hypodensity volume and worse outcome in stroke patients treated with tPA. Boysen and Christensen measured body temperature on admission and every 2 hours during the first 24 hours in 725 patients of acute stroke. They showed that 8 hours after stroke onset, higher body temperature was a negative predictor of outcome 3 months after stroke. Similar results have been reported by Reith et al., Castillo et al. and Jorgensen et al. However, our results differ from certain other studies. Kvistad et al. measured body temperature in 516 patients of ischemic stroke within 6 hours of onset of symptoms.

They concluded that low body temperature on admission was independently associated with a high NIHSS score within 6 hours of stroke onset in patients with ischemic stroke (P<0.001). They speculated that cold temperature prolongs coagulation time and worsens the clot formation, thus exacerbating the neurological deficit. The discrepancy between the study by Kvistad et al. and others can be explained due to different study design. Kvistad et al. measured body temperature within 6 hours of onset of symptoms of ischemic stroke whereas most other researchers recruited patients of ischemic stroke after 6 hours of start of symptoms. Limitations of current study include ecological fallacy, small sample size and non-adherence to more robust study designs.

**Conclusion**

It is concluded that body temperature as determined by rectal thermometer at time of presentation with stroke is moderately correlated with stroke severity as measured by NIHSS (r=-0.528).
References


CORRIGENDUM

Esculapio
Journal of Services Institute of Medical Sciences, Lahore

In Original Article,
“Prevalence of Undetected Refractive Errors Among School Children Aged 5-10 Years ”
By Shamaila Hussain Sumbal Inam, Aleena Butt and Mariam Raza, page # 28. The correspondence author’s name was printed as Shamaila hussain.

Now Volume 11, Issue 04, Oct - Dec. 2015 Page No. 28 should be read as follows: Shamaila Hassnain.
Objective: To know the incidence of microorganisms present in culture of maxillary sinus secretion in patients of chronic maxillary sinusitis.

Methods: We selected 86 patients diagnosed with chronic maxillary sinusitis for our cross sectional study. Ages of patients were ranging from 20y to 55y. Mean age was 34 years. All patients with diagnosis of chronic maxillary sinusitis were included in this study. In all 86 patients proof puncture done through Lichwitz trocar and cannula and sinus secretion was collected for culture.

Results: In our study we collected sinus aspiration from 86 patients. We found 78 (90.7%) patients were positive for bacterial infection and 8 (9.3%) patients were negative of any bacterial infection. In our study 38 (44%) patients were suffering from aerobic infection while 20 (23.25%) were suffering from anaerobic infection. Among aerobes, staphylococcus aureus was the most common bacteria isolated from sinus secretion of 9 (10.4%) patients. Almost one quarter patients were suffering from anaerobic bacterial infection. Twenty patients (23.25%) were suffering from both aerobic and anaerobic infections.

Conclusions: Chronic maxillary sinusitis is polymicrobial pathology. Various aerobes and anaerobes and mixed organisms are involved in its pathophysiology.

Keywords: Microorganisms, maxillary, sinusitis

Introduction
Many studies have been done about Chronic Rhinosinusitis (CRS) but there is no clear understanding about its true pathogenic organisms and mechanism of pathogenicity. Although there is much progress in medical field, but still we are not sure which agents are responsible for initiation and regulation of lymphocytic and eosinophilic activities which lead to CRS due to inflammatory events in mucosa of nose and sinuses. According to current researches, infectious agents like bacteria and fungi are the main causative agents responsible for Chronic Rhinosinusitis. Several researches have done on microbiology of acute rhinositis but there is no definitive data on actual distribution of pathogens in the patients of CRS. This variation may be due to variability in studies due to techniques and sample collection methods. Bacterial culture methods and antibiotics taken for long duration by patients are other factors which make it impossible to agree on a definitive diagnosis of pathogens. Because of the aforementioned reasons, we decided to study the microbiology of chronic maxillary sinusitis and know its distribution in our society.

Methods
This study was conducted in ENT Unit1 Mayo Hospital, Lahore. Current study duration is May 2014 to April 2015. The study design is clinical prospective study. After informed consent we selected 86 patients diagnosed with chronic maxillary sinusitis for our cross sectional study. Ages of patients were ranging from 20y to 55y. Mean age was 34 years. All patients with diagnosis of chronic maxillary sinusitis who are not responding to conventional treatment and did not take any antibiotics from last one month were included in this study. Patients younger than 20 years or suffering from acute maxillary sinusitis or under developed maxilla or maxillary fracture were excluded from the study. In all 86 patients proof puncture done through Lichwitz trocar and cannula. After apply local anesthetic spray and nasal decongestant a point 1.5 to 2 cm posterior to anterior end of inferior turbinate and near the attachment of concha was selected for puncture because the bone is very thin here to be punctured. Maxillary sinus was irrigated with 20ml of normal saline at 37° and sinus secretion was collected for culture and sent to Pathology Department of King Edward Medical University.

Results
In our study we collected sinus aspiration from 86 patients. We found 78 (90.7%) patients were positive for bacterial infection and 8 (9.3%) patients were negative of any bacterial infection. In our study 38 (44%) patients were suffering from aerobic...
infection while 20 (23.25%) were suffering from anaerobic infection. 20 (20.25%) patients were suffering from mixed bacterial infection (Table 1). Among aerobes, staphylococcus aurous was the most common bacteria isolated from sinus secretion of 9 (10.4%) patients. Streptococcus pneumoniae was present in 5 patients (5.8%) as shown in Table 2. Almost one quarter patients were suffering from anaerobic bacterial infection. Peptostreptococusspp was found to be present in 4 patients (4.65%). Prevotellamelaninogena was also found in 4 patients (4.65%). Twenty patients (23.25%) were suffering from both aerobic and anaerobic infections.

Table-1: status of microorganisms.

<table>
<thead>
<tr>
<th>Status of Microbes</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobes</td>
<td>38</td>
<td>44.18605%</td>
</tr>
<tr>
<td>Anaerobes</td>
<td>20</td>
<td>23.25581%</td>
</tr>
<tr>
<td>Mixed</td>
<td>20</td>
<td>23.25581%</td>
</tr>
<tr>
<td>Negative</td>
<td>8</td>
<td>9.302326%</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table-2: Details of microorganisms.

<table>
<thead>
<tr>
<th>Organism</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aerobes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staphylococcus Aureus</td>
<td>9</td>
<td>10.46512%</td>
</tr>
<tr>
<td>Streptococcus pyogenes</td>
<td>4</td>
<td>4.651163%</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>3</td>
<td>3.488372%</td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>2</td>
<td>2.325581%</td>
</tr>
<tr>
<td>Streptococcus Pneumoniae</td>
<td>5</td>
<td>5.813953%</td>
</tr>
<tr>
<td>Haemophilusparain? Uenzae</td>
<td>2</td>
<td>2.325581%</td>
</tr>
<tr>
<td>Streptococcus viridans</td>
<td>1</td>
<td>1.162791%</td>
</tr>
<tr>
<td>Pseudomonas aeroginosa</td>
<td>4</td>
<td>4.651163%</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>1</td>
<td>1.162791%</td>
</tr>
<tr>
<td>Klebsiellapneumoniae</td>
<td>1</td>
<td>1.162791%</td>
</tr>
<tr>
<td>Enterobacteraerogenes</td>
<td>3</td>
<td>3.488372%</td>
</tr>
<tr>
<td>Haemophilusinfluenzae</td>
<td>3</td>
<td>3.488372%</td>
</tr>
<tr>
<td><strong>Anaerobes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peptostreptococusspp</td>
<td>4</td>
<td>4.651163%</td>
</tr>
</tbody>
</table>

Discussion

The pathogenicity of chronic maxillary sinusitis is from a variety of microbes containing both aerobic and anaerobic bacteria. Studies show anaerobic bacteria varies from 25 to 56% in different researches. When using different methods, anaerobes can be isolated from more than half cases of chronic maxillary sinusitis. The prevalence of isolation of Gram-negative aerobic rods including Pseudomonas aeroginosa and Staphylococcus aureus also found in different range, from 1 to 29%. Chronic maxillary sinusitis is established of being caused by poor paranasal sinus ventilation and disorders of drainage due to obstruction of the ostiomeatal complex area in the middle nasal meatus. Nasal polyposis can also block the sinus ostia which lead to acute sinusitis, recurrent sinusitis or chronic sinusitis. Several studies show that most cases of chronic maxillary sinusitis with nasal polyposis are negative for bacterial infections in majority of cases. In some cases even PCR done which were negative. After introduction of FESS, several studies published on microbiology of chronic maxillary sinusitis after aspiration of sample through middle meatus. A study carried out shows a high association between chronic maxillary sinusitis and cultures results, taken from the secretion harvested from the middle meat us and maxillary sinus. Study suggest that it should be adopted as routine investigation for diagnosis and monitoring the patients with chronic maxillary sinusitis, in order to minimize treatment failure and increase the efficacy of antibiotics. In our study we collected sinus aspiration from 86 patients. We found 78 (90.7%) patients were positive for bacterial infection and 8 (9.3%) were negative of any bacterial infection. Most of patients in our study were...
positive for bacterial infection thus showing the most common cause of chronic maxillary sinusitis is bacterial. This finding is in accordance to study done in other center. Only 8 (9.3%) patients were negative for bacterial infections which is in accordance to a study. In our study 38 (44%) patients were suffering from aerobic infection while 20 (23.25%) were suffering from anaerobic infection. 20 (20.25%) patients were suffering from mixed bacterial infection. Aerobic and anaerobic bacterial infections are very common causes of chronic bacterial sinusitis also reported by other studies. Only 8 (9.3%) patients were negative for bacterial sinusitis among 86 patients. Same sterile chronic maxillary sinusitis observed by other researchers. Among aerobes, staphylococcus aureus was the most common bacteria isolated from sinus secretion of 9 (10.4%) patients. Increased incidence of staphylococcus aureus also reported in a study. Streptococcus pneumonia was second most common aerobic bacteria diagnosed in 5 (5.82%) patients. Streptococcus pyogenes and Pseudomonas aeruginosa isolated from maxillary sinus secretion of each (4.65%) patients. Enterobacter aerogenes isolated from 3 (3.4%) samples, same for Haemophilus influenza. Staphylococcus epidermidis and Haemophilus parainfluenzae diagnosed in 2 (2.3%) patients each. Streptococcus viridans, Proteus mirabilis and Klebsiella pneumonia were least pathogenic aerobic organisms, found in only 1 (1.16%) patient each. Aerobic infection of chronic maxillary sinusitis also observed in another study. Almost one quarter patients were suffering from anaerobic bacterial infection. 4 (4.6%) patients were suffering from Peptostreptococcus spp, Prevotella melolactica and clausiodrum spechae. These anaerobic bacteria found in another study to cause chronic maxillary sinusitis, second most aerobic infection was Eubacterium spp in 3 (3.4%) patients. Prevotella intermedia and Bacteroides spp found in 2 (2.3%) samples each. Fusobacterium nucleatum was least pathogenic anaerobe found in 1 (1.16%) patient only. Anaerobes are also found to be cause of chronic maxillary sinusitis in another study. Twenty patients (23.25%) were suffering from both aerobic and anaerobic infections. Eight patients (9.3%) found negative for any bacterial infection among the series of 86 patients. In various studies it has been found that chronic maxillary sinusitis can be caused by mixed bacteriology.

Conclusion
Chronic maxillary sinusitis is polymicrobial pathology. Various aerobes, anaerobes and mixed organisms are involved in its pathophysiology.

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References
Malaria is a vector-borne disease caused by the bite of the female Anopheles mosquito, inoculating the sporozoites in the human bloodstream, leading to clinical manifestations. Four species of Plasmodium can cause malaria in human beings. These include Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale, and Plasmodium malariae. According to the World Health Organization assessment, about 40% of the world population is at risk of developing malaria. About 300-500 million people are infected with it. Every year about 2 million people die due to malaria and its complications. The highest mortality is in Africa, mainly in young children. In spite of worldwide efforts to reduce malaria transmission, it is still the major cause of morbidity and mortality, with an overall fatality rate of 10-30%. Malaria is associated with high mortality and morbidity all over the world. Malaria results in the loss of 35,728,000 Disability Adjusted Life Years, revealing the worldwide impact of this disease. The geographical distribution of the disease is worldwide, being found in tropical areas, throughout Sub-Saharan Africa and to a lesser extent in Southeast Asia, South Africa, the Pacific Islands, India and Central and South America. Pakistan is among the countries having a high infectivity rate of malaria. The Directorate of Malaria Control has reported that one person per thousand in the population is infected with malaria. Active malarial transmission happens throughout the year, while aggressive outbreaks of disease are seen mainly during and after the 'monsoon' season.

Malaria is usually associated with various degrees of reduced blood counts. Though the anemia is hemolytic in nature, the hemopoietic response is blunted, as evidenced by disproportionate reticulocyte counts, reduced platelets and WBC.

Objective: The aim of the present study was to evaluate hematological changes in malaria in Mardan, Pakistan.

Methods: This prospective observational study was conducted at the outpatient department of Mardan Medical Complex from July to September 2015. A total of 115 patients were divided into two groups of <15 and >15 years old. Malaria parasite was examined using thick and thin smears stained with Giemsa stain and also cross-checked by ICT. Those patients with a confirmed diagnosis of malaria were investigated for platelets, hemoglobin, and total leukocyte count on an Automatic Hematology analyzer (Mindray) and studied by a hematologist. Data was tabulated, descriptive statistics analyzed; the chi-square test was applied to evaluate statistical significance of the studied variable between groups on SPSS version 20. A p-value of 0.05 or less was used for statistical significance.

Results: A total of 115 patients were included in the study. Male were 56 (48.7%) and females 59 (51.3%), the mean age of the study group was 10.62 (3.89). According to age group, patients were divided into two groups; those <15 years comprised of 102 (88.7%), while >15 years were found 13 (11.3%). P. vivax was seen in 108 (93.9%) and P. falciparum 7 (6.1%) patients. Out of total population 70 (60.9%) were found anemic, 79 (68.7%) had mild thrombocytopenia and 4 (3.5%) with moderate thrombocytopenia and severe leukopenia were found 2 (1.7%), mild leukopenia 24 (20.9%), mid leukocytosis 1 (0.9%). Patients with P. vivax aged <15 years had found anemia 59 (62.1%) with p=0.56, moderate thrombocytopenia 4 (4.2%) (p=0.05), severe leukopenia 2 (2.11%), mild leukopenia 13 (13.7%) and mild leukocytosis 1 (1.1%) with p=0.001.

Conclusions: The present study concludes that thrombocytopenia and anemia are common hematological findings in patients with Plasmodium infection particularly vivax species infection in Mardan region. Therefore, malaria should be a consideration in febrile patients with low platelets and hemoglobin.

Keywords: Malaria, anemia, leukocyte, thrombocytopenia.
counts indicating some blem with manufacturing apparatus. Mild or moderate thrombocytopenia is a common association of malaria and is rarely associated with hemorrhagic manifestations or a component of disseminated intravascular coagulation.\(^8,9,10\) Thrombocytopenia has been reported in the majority of malaria studies.\(^11,12,13,14,15\) Laboratory alterations associated with malaria are well recognized but specific changes may vary with level and type malaria endemicity, demographic factors and malaria immunity.\(^16\) The aim of the present study was to determine evaluate hematological changes in malaria in Mardan, Pakistan.

**Methods**

This prospective observational study was conducted at O.P.D of Mardan Medical Complex with the facilities of clinical laboratory. The duration of study was from July to August 2015. Patients with fever and positive MP slide were included in the study and all patients with fever but negative for MP slide were excluded from the study. Both the thick and thin films were advised to the patients. A total of 115 patients were divided to age groups of <15 and > 15 years old. Malaria parasite was examined using thick and thin smears stained with Giemsa stain and also cross-checked by ICT. Those patients with a confirmed diagnosis of malaria were investigated for platelets, hemoglobin and total leukocyte count on Automatic hematology analyzer (Mindray) and studied by hematologists. On the basis of hemoglobin, two groups were classified as group A having hemoglobin < 10 gm/dL and group B having hemoglobin >10 gm/dL. The normal range of leukocytes was taken as 4000-11000/cmm, any deviation from this limit was noted as abnormal. Thrombocytopenia was defined as mild (Platelets 50-150x10^3 cells/ul), moderate (Platelets 20-50x10^3 cells/ul) and severe (Platelets <20x10^3 cells/ul).\(^17\) All the data were tabulated, descriptive statistics were analyzed, and the chi-square test was applied to evaluate statistical significance of the studied variable between groups on SPSS version 20. A p-value of 0.05 or less was used for statistical significance.

**Results**

A total of 115 patients were included in the study. Male were 56(48.7%) and females 59(51.3%), the mean age of study group was 10.62(3.89). According to age group, patients were divided into two groups; those <15 years comprised of 102(88.7%), while > 15 years were found 13(11.3%).

<table>
<thead>
<tr>
<th>Table-1:</th>
<th>Age and sex distribution n=15.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td>Male</td>
<td>56</td>
</tr>
<tr>
<td>Female</td>
<td>59</td>
</tr>
<tr>
<td>Age&lt;15 years</td>
<td>102</td>
</tr>
<tr>
<td>Age&gt; 15 years</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table-2:</th>
<th>Laboratory profile n=115.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td>Hb</td>
<td>Anemia</td>
</tr>
<tr>
<td></td>
<td>No anemia</td>
</tr>
<tr>
<td>Platelets</td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td>Mild thrombocytopenia</td>
</tr>
<tr>
<td></td>
<td>Moderate thrombocytopenia</td>
</tr>
<tr>
<td></td>
<td>Severe leukopenia</td>
</tr>
<tr>
<td></td>
<td>Mild leukocytosis</td>
</tr>
<tr>
<td></td>
<td>Mild leukocytosis</td>
</tr>
</tbody>
</table>
**Table-3:** Profile of P.vivax, P. Falciparum according to age group.

<table>
<thead>
<tr>
<th>Malaria</th>
<th>Age Group</th>
<th></th>
<th></th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. Vivax</td>
<td>Anemia</td>
<td>&lt;15 years n=102</td>
<td>&gt;15 years n=13</td>
<td>66 (61.1%)</td>
<td>0.56</td>
</tr>
<tr>
<td>N=108 Hb</td>
<td>No Anemia</td>
<td></td>
<td></td>
<td>42 (38.9%)</td>
<td></td>
</tr>
<tr>
<td>Platelets</td>
<td>Moderate Thrombocytopenia</td>
<td>4 (4.2%)</td>
<td>0 (0.0%)</td>
<td>4 (3.7%)</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Mild Thrombocytopenia</td>
<td>69 (72.6%)</td>
<td>6 (46.2%)</td>
<td>75 (69.4%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal platelets</td>
<td>22 (23.2%)</td>
<td>7 (53.2%)</td>
<td>29 (26.9%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe leucopenia</td>
<td>2 (2.11%)</td>
<td>0 (0.0%)</td>
<td>2 (1.9%)</td>
<td></td>
</tr>
<tr>
<td>TLC</td>
<td>Mild leucopenia</td>
<td>13 (13.5%)</td>
<td>8 (61.5%)</td>
<td>21 (19.4%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>19 (94.0%)</td>
<td>5 (38.5%)</td>
<td>84 (77.8%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mild leukocytosis</td>
<td>1 (1.1%)</td>
<td>0 (0.0%)</td>
<td>1 (0.9%)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Moderate leukocytosis</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe leukocytosis</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>P. Vivax</td>
<td>Anemia</td>
<td></td>
<td></td>
<td>4 (57.1%)</td>
<td>0.48</td>
</tr>
<tr>
<td>N=7 Hb</td>
<td>No Anemia</td>
<td></td>
<td></td>
<td>3 (42.9%)</td>
<td></td>
</tr>
<tr>
<td>Platelets</td>
<td>Moderate Thrombocytopenia</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mild Thrombocytopenia</td>
<td>4 (57.1%)</td>
<td>Nil</td>
<td>4 (57.1%)</td>
<td></td>
</tr>
<tr>
<td>TLC</td>
<td>Normal platelets</td>
<td>4 (42.9%)</td>
<td>Nil</td>
<td>3 (42.9%)</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>Severe leucopenia</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mild leucopenia</td>
<td>1 (25%)</td>
<td>2 (66.7%)</td>
<td>3 (42.9%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>3 (75%)</td>
<td>1 (33.3%)</td>
<td>4 (57.1%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mild leukocytosis</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moderate leukocytosis</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe leukocytosis</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>

**Fig-1:** Frequency of malaria type n=115.

**Fig-2:** Frequency of thrombocytopenia n=115.
Discussion

The hematological changes related with malaria are familiar, but precise changes may vary with category of malaria, with the background of hemoglobinopathy, nutritional status, demographic factors and malaria immunity. In this study, the frequency of P. vivax was higher 108 (93.9%) as compared to P. falciparum 7(6.1%). A study conducted by Bega et al, in a tertiary care hospital in Karachi which showed P. vivax in 52% and P. falciparum in 46% of patients with acute malaria. In other study, P. vivax was detected in 54% and P. falciparum in 39% in the pediatric age group studied by Jalaluddin which showed a higher frequency of P. falciparum as compared to P. vivax (65% vs. 35%) in children.

Present study reported thrombocytopenia out of the total population was 79(68.7%) as mild and 4(3.5%) as moderate thrombocytopenia. In cases of P.vivax and age > 15 years reported moderate thrombocytopenia 6(46.2%) and in P. falciparum it was 4(57.1%). A study conducted by Qurban et al, reported 93.33% of thrombocytopenia in patients having Plasmodium vivax. In contrast to our study Jadhav and Patkar conducted an extensive study regarding pattern of thrombocytopenia in patients having vivax and falciparum malaria. They documented thrombocytopenia in both groups of patients but severe thrombocytopenia, (platelets 20,000 or less) was more consistent with Plasmodium falciparum malaria, while Memon has reported thrombocytopenia in malaria to be about 70%. Platelets may play a role in the pathophysiology of severe malaria. Malaria is associated with a pro-coagulant tonus characterized by thrombocytopenia, activation of coagulation cascade and fibrinolytic system. However, bleeding and hemorrhage are uncommon; suggesting that a compensated state of blood coagulation activation occurs in malaria.

The degree of thrombocytopenia has been considered a criterion of disease severity by David, et al. in the United Kingdom. Thrombocytopenia may result from a shortened life span of the platelets or from pooling and destruction in the spleen. Present study reported 79(68.7%) anemia out of total studied population, of which 59(62.1%) anemic cases were < 15 years old and 7(53.8%) under 15 years age group. Anemia was also reported in 56.45% of malaria patients by Qurban et al, as another hematological indicator. The etiology of anemia in malaria is multi-factorial. It may be due to intravascular haemolysis, splenic removal of the infected cells, immune complex adsorption onto erythrocyte membranes, effects of therapeutic agents on parasitized cells and bone marrow erythropoiesis. Furthermore, some observers have suggested that malaria-related anemia is more severe in the areas of intense malaria transmission and in younger children rather than older children or adults. The hemoglobin changes observed in this study population may reflect a higher prevalence of underlying anemia, poor nutritional status and non-availability of proper treatment.

Present study found sever leucopenia 2(1.7%), mild leucopenia 24(20.9%) and mild leucocytosis 1(0.9%) of the total studied population. According type of malaria and age group, P. vivax infected patients with age < 15 years found sever leucopenia 2(2.1%), mild leucopenia 13(13.7%) and mild leucocytosis 1(1.1%), and in patients > 15 years old had mild leucopenia 8(61.5%). Patients of P.falciparum with age < 15 years had mild leucopenia 1(25%) and with age > 15 years had mild leucopenia 3(42.9%).

A study of malaria and hematological changes reported mild to moderate leucopenia characterized by decreased neutrophils, left shift and moncytosis. Leucopenia is thought to be due to the localization of leucocytes away from peripheral circulation, splenic sequestration and other marginal pools rather than actual depletion or stasis. Leucocytosis may suggest co-existing viral infection particularly in the presence of atypical lymphocytes common in children with concurrent viral infections. Many recent studies also show leucocytosis among the malaria patients. Adedapo et al, reported leucocytosis in about 9.5% of the patients with malaria. Leukocytosis may also have some relation with poor prognosis of disease, in relation to the value of leucocytosis in malaria. Studies have been conducted in P. falciparum infected African children with similar results showing poor prognosis. A co-existing viral infection should always be considered in patients presenting with acute malaria and leucocytosis. In case of neutrophilic leucocytosis, intravascular hemolysis, disseminated intravascular coagulation or additional bacterial infection must be investigated.

Conclusion

Thrombocytopenia and anemia were common hematological findings in patient with Plasmodium infection particularly marked in vivax species.
infection. Therefore, malaria should be a consideration in febrile patients with low platelets and haemoglobin. Patients with acute febrile illness having combination of thrombocytopenia and anaemia should alert the treating physician about the possibility of malaria infection which can be confirmed with specific tests.

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References

28. Owusu-Agyei S, Fryauff DJ, Chandramohan D, Koram KA,


Answer Picture Quiz

Large pneumoperitoneum following PEG placement attempt

During the procedure the wire had difficulty advancing externally from the stomach and was noted to be tense. General surgery was consulted and the area of the incision was extended. The wire was then extracted, and during the extraction there was an audible “pop.” Post procedure the patient had abdominal distention and increased work of breathing as well as dyspnea and hypoxia. He required 100% non-rebreather oxygen and was saturating below 90% for approximately one hour. His chest and upper abdominal x-ray was significant for pneumoperitoneum. However, his abdominal distention and respiratory status would improve over the next several hours and a repeat x-ray performed less than 6 hours later showed complete resolution of subdiaphragmatic air. The patient had PEG placement performed 2 days later without complication. Pneumoperitoneum following percutaneous endoscopic gastrostomy tube placement is a common complication. Its incidence is noted to be approximately 20% in one series. Amongst these cases, only 4.6% had subdiaphragmatic air visualized after 72 hours and none of these cases were found to be clinically significant. CO2 has been increasingly used for insufflation due to its rapid absorption and has been shown to reduce the frequency of post-PEG pneumoperitoneum.
Introduction

Osteoporosis is one of those skeletal disorders in which there is low bone mass and deterioration of micro-architectural bone tissue; with a subsequent increase in bone fragility and vulnerability to fractures. Historically, evolitional bone loss was documented about 150 years back, by Sir Astely Cooper, who performed an experiment and figured out that bone loss was associated with hip fractures. The name, 'Osteoporosis' was initially used in medical cordon in the 1900's by French and German clinicians while presenting the histology of osteoporotic bone. Osteoporosis is a vital community health issue that is affecting about 200 million people throughout the world. 20 million people aged 45 or above have been registered with this disease in the United States. In United States and Europe, 30% of the women who had had their menopause have osteoporosis.

Increasing life expectancy have resulted in aging of the population and increased rates of chronic-degenerative diseases. In Asia, for the last thirty years, the risk of having hip fractures had increased two to three times and it is distressfully predicted that half of the total world fractures will take place in Asia by 2050. The prevalence of osteoporosis in China among the middle-aged and elderly people is 16.1% in 2002. The prevalence among males was 11.5% and among females was 19.9% respectively.

India is largely perturbed by osteoporosis where one out of three females is affected from osteoporosis while one out of 8 men is affected by this disease. In 2003, the approximate number of osteoporotic patients (both male and females) in India was twenty six million and according to the committee of experts, this number is predicted to rise thirty six million by the year 2013.

Pakistan has a high prevalence of osteoporosis as 97% of women aged from 75 to 84 years while 55% of women aged from 45 to 54 years suffer from osteoporosis in Pakistan.

Osteopenia leads to osteoporosis which is a disease that lowers bone mineral density than normal. Bone mineral density (BMD) alludes to the volume of matter for every square centimeter of bones. Throughout adulthood, bone mineral content is reliant on peak bone density accomplished during development and Following bone loss; hence, low BMD can result from increased bone loss, lacking bone accretion, or both. This ailment, present in both patients...

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Objective: The objective of this study is to identify risk factors related to low BMD among patients attending the Centre for Nuclear Medicine (CENUM).

Methods: It was a cross sectional study conducted at the Centre for Nuclear Medicine (CENUM) Mayo Hospital Lahore, from February 2011 to September 2011. A sample of 246 participants aged 50 to 85 years (both male and female) was selected using non probability convenient sampling technique. Magnitude of BMD status was described using T score as WHO criteria. The data was analyzed by using SPSS version 17. Pearson Correlation was applied to find relationship between different quantitative variable. Also, an independent sample T test was applied to see the significant difference.

Results: The results have shown that out of 246 participants, 24 (9.8%) were men and 222 were women (90.2%) aged 50-85 yrs. BMD has significant correlation with age, weight and height of the patients (p ≤ 0.05 for both at Left Hip and lumber spine T score). Also, the patients who did physical activity and had sufficient intake of calcium supplement showed better BMD (p ≤ 0.05 for both Left Hip and lumber spine T score respectively) as compared to other patients. The patients who had low backache also showed low BMD (p ≤ 0.000 for Left Hip and p ≤ 0.000 for Lumber spine T score).

Conclusions: Based on the study results it is concluded that low BMD is a wide spread public health problem and it needs due importance.

Keywords: BMD, DXA, left hip T score, lumber spine T score, WHO, CENUM
sexes also related to genetic and environmental factors, is becoming a foremost community health issue in developed countries.

The bone mineral density is regulated by the intestinal absorption, renal excretion, bone uptake and release of the calcium; each of which is regulated by the parathyroid hormone, calcitonin and vitamin D. Low BMD is associated with physical aspects like increasing age, female sex, family history of osteoporosis, irregularity of menstrual cycles, premature menopause, zero history of pregnancies, specific medicine use (anticonvulsants, corticosteroids, diuretics, aluminum hydroxide and anti-inflammatory drugs). In addition, the behavioral factors like low intake of calcium, high amount of protein consumption, intake of coffee and sodium, use of alcohol, smoking, and sedentary lifestyle are also contributing factors.

The peak bone mass is acquired during adulthood, once maximal skeletal mass is attained after 30 to 40 years, a small loss in bone formations take place with every resorptionand formation cycle of each basic multi-cellular unit. Thus, bone loss related to age, which may be average 0.7% every year, is the standard and expected biological phenomenon parallel to hair changing their color to gray. Both sexes are affected equally and ethnically whites are more affected than blacks. Differences in the peak skeletal mass in men compared with women and in blacks versus whites may explain to some extent that why certain populations are prone to be afflicted by this disease.

Osteoporosis has no alarming signs; often the first manifestation of disease is pain or fracture. Approximately all non-vertebral fractures are caused by fall, even though, vertebral fractures often take place without a fall, and might not necessarily be painful. Virtually, two thirds are painless and one third of vertebral fractures are painful. Underlying vertebral compression fractures presented by considerable height loss over the years might not show any significant associated with back pain.

Dual-energy X-Ray Absorptiometry (DXA) provides a convenient and harmless way of measuring BMD accurately, reproducibility and with minimal radiation exposure. Bone mineral density is assessed by DXA scan at neck of femur (hip) and lumber spine as these points increase the incidence of any osteoporotic fracture two to three fold. DXA scan uses X-rays to measure bone mineral density. In this scan, the radiation dose is about 1/10th of a standard chest X-ray. DXA scan of hip and spine is clearly differentiated from other bone densitometry techniques because of its multiple advantages; the results obtained with this scan are analyzed applying the World Health Organization T-score definition of osteoporosis. DXA results provide an authenticated proficiency and effectiveness to predict the risk of fracture and targeting anti-fracture therapies to facilitate the response to treatment.

**Bone Mineral Density (BMD)**

Measured by Dual Energy X-Ray Absorptiometry Scan (DXA).

T Score: It is a comparison of patient bone density to the bone density of a 30-year-old person of the same sex and ethnicity.

**World Health Organization Criteria for Bone mineral Density:**

- T-Score more than -1 or higher = Normal
- T-Score from -2.5 to -1 = Osteopenia
- T-Score below -2.5 = Osteoporosis

**Methods**

This cross sectional study was done at the Centre for Nuclear Medicine (CENUM) Mayo Hospital Lahore, from February 2011 to September 2011. A sample of 246 participants was selected using non probability convenient sampling technique. The study was conducted on the patients attending CENUM for dxa scan aged 50 to 85 years (both male and female).

A structured questionnaire was developed including all the variables of interest for use during the interview. After the investigator introduced, medical history was take from each patient including medical history (presenting complaint) and relevant life style pattern.

The investigator inquired the age, weight (kg), height (cm) educational status, eating habits, intake of milk in term of one glass or two (250 500mls)/day and history of intake of calcium (500 1000 mg)/day daily or on alternate days.

The investigator asked the patients about his/her smoking habits. The level of physical activity was inquired from the patients, like walking. It was asked from the patients for their number of children. Menstrual and lactational history was asked from female patients. It was also asked about other clinical presentations from the patients came for DXA scan.

For DXA scan, the patients were asked to lie down and take off metallic things on their body (if any). Patients were asked to position according to the requirement of DXA scan under the supervision of the technician.
scan of lumber region (from L1 to L4) and neck of the femur (Left Hip) was recorded on computer with inbuilt system. Bone mineral density content and T-scores were recorded. Magnitude of BMD status was described using T score as WHO criteria. The result of DXA scan of each patient consisted of Lumber spine and Left Hip T score was achieved for this research. The data was analyzed by using SPSS version 17. Data was described in terms of frequencies and percentages for categorical variables. Correlation was applied to find relationship between different quantitative variable. Also, an independent sample T test was applied to see the significant difference.

Results
The results have shown that most of the patients in this study were female. Most of the patients were from urban area (91.5%). Also, most of the patients were married (83.3%). Table 2 shows mean and standard deviation of age, weight, height, Left Hip T score and Lumber Spine T score of study sample. Table 3 shows correlation of Left Hip T score and Lumber Spine T score with age, weight and height of patients. It shows that T score of both Left Hip and Lumber Spine is significantly correlated with age, weight and height of patient. The correlation coefficient is negative for age because as the age increases BMD tend to decline whereas correlation coefficient is positive for height and weight i.e; as the weight and height increases BMD also improves.

Table 4 shows that out of 246 patients 148 patients came with the complaint of low backache. The Left Hip T score was significantly less (p<0.000) for low backache patients as compared to patients with no complaint of low backache , so the patients with complaint of low backache were more prone to low BMD. Also, 191 patients who did not walk daily had significantly less Left Hip T score (p<0.05) so, lack of physical activity plays an important role for low BMD. Out of 246 patients, 76 patients did not take dairy products regularly and had less Left Hip T score suggesting that insufficient use of dairy product influence the BMD of Left Hip. Calcium intake has also significant effect on BMD (p = 0.001) as 48 patients who were not taking calcium had significantly less Left Hip T score as compared to those patients who had sufficient calcium intake. There was only 4 patients in this study who were smoker and there Left Hip T Score was less as compared to nonsmokers (p = 0.632). Table 5 shows that Lumber Spine T score was significantly less for those patients who had complaint of low backache (p < 0.000) as compared to other patients. Similarly patients who did not walk daily and had no intake of calcium also showed significantly less Lumber Spine T score (p<0.05) as compared to those who did walk and take calcium regularly. The patients who did not use of dairy product also had less Lumber Spine T score (p=0.383). The smoker patients in the study also had less Lumber spine T score (p=0.475) as compared to non smokers.

Table 1: Demographic characters (n= 246).

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>24</td>
<td>9.8</td>
</tr>
<tr>
<td>Female</td>
<td>222</td>
<td>90.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>225</td>
<td>91.5</td>
</tr>
<tr>
<td>Rural</td>
<td>21</td>
<td>8.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>6</td>
<td>2.4</td>
</tr>
<tr>
<td>Married</td>
<td>205</td>
<td>83.3</td>
</tr>
<tr>
<td>Widow</td>
<td>32</td>
<td>13.0</td>
</tr>
<tr>
<td>Divorced</td>
<td>3</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Table 2: Descriptive statistics of study variable.

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>60.95</td>
<td>8.54</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight in kg</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>70.50</td>
<td>13.49</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>154.63</td>
<td>7.81</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Left Hip T Score</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.41</td>
<td>1.22</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lumber Spine T Score</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.45</td>
<td>1.53</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Relationship of T score and different demographic factors.

<table>
<thead>
<tr>
<th>Age (in years and months)</th>
<th>Weight</th>
<th>Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson correlation</td>
<td>-0.321</td>
<td>0.183</td>
</tr>
<tr>
<td>P-Value</td>
<td>0.000</td>
<td>0.004</td>
</tr>
</tbody>
</table>

| Lumber spine T Score      | Pearson Correlation | -0.140 | 0.156*    |
|                          | P-Value             | 0.028  | 0.014     |
### Table-4: Comparison of Left Hip T Score with different risk factors.

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Left Hip BMD</th>
<th>Total (%)</th>
<th>P-valu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Stanard Deviation</td>
<td></td>
</tr>
<tr>
<td>Low backache</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.8095</td>
<td>1.08360</td>
<td>148 (60.16%)</td>
</tr>
<tr>
<td>No</td>
<td>-.8051</td>
<td>1.16896</td>
<td>98 (39.84%)</td>
</tr>
<tr>
<td>Walk daily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.1327</td>
<td>.98959</td>
<td>55 (22.4%)</td>
</tr>
<tr>
<td>No</td>
<td>-1.4890</td>
<td>1.26974</td>
<td>19 (77.6%)</td>
</tr>
<tr>
<td>Dairy product</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.9841</td>
<td>1.17446</td>
<td>170 (69.1%)</td>
</tr>
<tr>
<td>No</td>
<td>-1.4658</td>
<td>1.24232</td>
<td>76 (30.9%)</td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.0924</td>
<td>1.15525</td>
<td>145 (75.13%)</td>
</tr>
<tr>
<td>No</td>
<td>-1.7542</td>
<td>1.23701</td>
<td>48 (24.87%)</td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.7000</td>
<td>1.25698</td>
<td>4 (1.6%)</td>
</tr>
<tr>
<td>No</td>
<td>-1.4045</td>
<td>1.22143</td>
<td>242 (98.4%)</td>
</tr>
</tbody>
</table>

### Table-5: Comparison of Left Lumber T Score with different risk factors.

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Lumber Spine T Score</th>
<th>Total</th>
<th>P-valu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Stanard Deviation</td>
<td></td>
</tr>
<tr>
<td>Low backache</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.964</td>
<td>1.4441</td>
<td>148 (60.16%)</td>
</tr>
<tr>
<td>No</td>
<td>-.661</td>
<td>1.3192</td>
<td>98 (39.84%)</td>
</tr>
<tr>
<td>Walk daily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.051</td>
<td>1.3562</td>
<td>55 (22.4%)</td>
</tr>
<tr>
<td>No</td>
<td>-1.558</td>
<td>1.5645</td>
<td>19 (77.6%)</td>
</tr>
<tr>
<td>Dairy product</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.572</td>
<td>1.4713</td>
<td>170 (69.1%)</td>
</tr>
<tr>
<td>No</td>
<td>-1.388</td>
<td>1.5599</td>
<td>76 (30.9%)</td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-1.087</td>
<td>1.4847</td>
<td>145 (75.13%)</td>
</tr>
<tr>
<td>No</td>
<td>-1.454</td>
<td>1.4964</td>
<td>48 (24.87%)</td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-.9</td>
<td>.6928</td>
<td>4 (1.6%)</td>
</tr>
<tr>
<td>No</td>
<td>-1.445</td>
<td>1.5116</td>
<td>242 (98.4%)</td>
</tr>
</tbody>
</table>
Discussion
The current research was carried out to assess the bone mineral density (BMD), socio-demographic and symptomatic profile of patients visiting the Centre for Nuclear Medicine (CENUM) for DXA scan. Majority of the patients were female i.e. 222 out of the total 246. In the current study, most of the patients suffering from low bone mineral density were from urban segment of the population i.e.; 225 out of 246. We have seen in current study as the patient's age increased they were more prone to decrease bone mineral density. This result is similar to the result of a study conducting in India and it has been observed that 37.1% of the women in age 50-59 years suffered from osteopenia and 37.5% of women in age group of 60 and above had osteoporosis. The present study showed that bone mineral density of patients was highly affected by their weight and height. The patients with weight less than 50 kg and more than 80 kg weight, were more prone to low bone mineral density. It has been found that women with BMI less than 16 and weight less than 60 kg were at higher risk of osteoporosis in both Iran and India. Most of the patients (148) in this study came with the problem of low backache. The results of this study indicated that bone mineral density was significantly affected by low backache. The result of our study is comparable with the results of other studies. BMD of Hip and Spine had a negative relationship with chronic low backache. Previous studies and the current study assessed that chronic low backache can lead to low BMD. The current study clearly illustrated that bone mineral density is remarkably influenced by physical activity. There is an increased threat of having low BMD both at Left Hip and Lumber spine in patients who did not use to walk daily. So, there is a vital role of physical activity to reduce the risk of low BMD.

The consumption of dairy products also affect Left Hip and Lumber Spine T score. Dairy products are richer in calcium, protein, potassium, magnesium, zinc and phosphorus per calorie than any other delicious food. A sufficient intake of milk and milk products is a best source for optimal bone formation but also a way to prevent enhanced bone resorption as expressed by the 40% to 50% reduction of the serum osteocalcin.

Most of the patients in this current study used to take calcium as a supplement. The calcium intake had a significant effect on the bone mineral density of Left Hip and Lumber spine .This is similar to the previous studies which reported that continuous intake of calcium over three years decreased the threat of osteoporosis. The result of this study illustrated a non-significant association between low bone mineral density and smoking while in other studies indicated a significant effect of smoking on BMD at femur neck and lumbar spine (p <0.05). In our study there was no obvious relationship between smoking and low BMD as most of the patients were females and the ratio of female smokers in Pakistan is very less in comparison to other countries due to our cultural and traditional boundaries.

Conclusion
On the basis of the results of this study it is concluded that bone mineral density is influenced by advanced age, low education, sedentary lifestyle and insufficient intake of calcium. All these factors clinically lead to generalized aches and pains especially low backache. The postmenopausal women were more effected by this low bone mineral density as compared to men of their age due to the lack of protective role of estrogen.

The results of this study highlighted that people in advanced age should take care of their diet (it should be rich in calcium) and physical activity especially the postmenopausal women should be more aware about this crippling disease which slowly but horribly spreads.

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References

Osteopoikilosis: A Rare Incidental Spotted Bone Disease on CT

Khalid Rehman Yousaf, Tanweer Ahmed, Salman Atiq, Qamar Sardar Sheikh, Nasir Qadri and Nazir Ahmed

Abstract: Osteopoikilosis is a benign, asymptomatic, sclerosing bone dysplasia with an autosomal dominant trait. The disease is characterized by diffuse symmetrical small round and ovoid radiopacities in the juxta-articular region of cancellous bone. We report a rare case of a middle aged female presented with abdominal distension, whose radiological work up revealed an incidental osteopoikilosis.

Keywords: Osteopoikilosis, CT scan, spotted bone disease, benign, asymptomatic.

Introduction
Osteopoikilosis (OP) is a benign sclerosing bone dysplasia. It is an asymptomatic, autosomal dominant trait which may mimic many different bone pathologies. It is also known as osteopathic condensans disseminata or spotted bone disease. The disease is associated with dermatofibrosis lenticularis disseminata (Buschke-Ollendorf Syndrome). We report a rare case of osteopoikilosis in a middle aged female presented with abdominal distension, asymptomatic for any musculoskeletal pathology. Incidental diagnosis of osteopoikilosis was established during radiological workup. So far, we didn't find any published case report in Pakistani literature related to osteopoikilosis.

Case Report
A 42 years old female presented at outpatient department with a complaint of dull abdominal pain and distension for the past 3 months. She also had decreased apatite over the period of illness; however, there was no significant weight loss. No bowel related abnormality was narrated by the patient. Systemic review was unremarkable including musculoskeletal system. Clinical examination revealed abdominal ascites besides a non-tender abdomen, later confirmed on a transabominal ultrasound scan. Patient was sent to our department for cross-sectional imaging of abdomen with clinical diagnosis of intestinal tuberculosis. CT scan abdomen revealed gross ascites, however, the cause was not ascertained. A note was made of bilateral moderately dilated pelvicalyceal system (PUJ obstruction). Multiple well defined 2-5 mm circular to ovoid hyperdense spots were visualized in the cancellous part of vertebrae, pelvic bones and epiphyses of the femur. These hyperdensities were located in cancellous part of bone.

As the radiological findings were unexpected, an X-ray of the pelvis and shoulder were also acquired which confirmed the findings. All bones were free of any cortical erosion or periosteal reaction. The diagnosis of osteopoikilosis was established.

Discussion
Osteopoikilosis is a rare bone dysplasia found in less than 0.1 per million. Radiologically, it is characterized by diffuse symmetrical bone islands, small round and ovoid radiopacities in the Juxtaarticular regions of

Fig-1: Gross ascites with bilateral moderately dilated pelvicalyceal system (PUJ obstruction). Multiple well defined 2-5 mm circular to ovoid hyperdense spots in the cancellous part of vertebrae, pelvic bones and distal end of the femur. Being an incidental finding, patient was counseled that the condition was benign and static, that is not going to harm her. The diagnostic tap analysis of ascitic fluid turned out to be reactive in nature, and the patient was treated accordingly by the attending physicians.
Fig-2: A/P projection of right shoulder shows multiple variable sized circular to ovoid radio-opacities in the cancellous part of proximal humerus. A/P projection of pelvis revealing subcentimeter radio-opacities in the cancellous part of pelvic bones and proximal femur. Note the intraluminal contrast agent in the rectum due to oral preparation for CT abdomen.

Bone are characteristic radiologic signs in cancellous bone which may appear at birth or during skeletal growth. It is usually found in the metaphyseal and epiphyseal regions of long bones, the carpals and tarsals, the end of large turbular bones and around the acetabula. It is occasionally associated with hereditary multiple exostosis, scleroderma and dermatofibrosis lenticularis disseminata. Osteopoikilosis must be considered as a distinct clinical entity. Several diseases should be taken under consideration for its differential diagnosis, such as osteoblastic metastasis, tuberous sclerosis, Paget’s disease, mastocytosis, osteopathia striata, melorheostosis, synovial chondromatosis, sesamoid ossicles and Ollier’s disease. As a general rule for metastasis, the radiographic pattern is lytic type and may cause subcortical destruction. The lesions in OP are symmetric, smaller, uniform size and do not cause cortical erosions. Due to the benign nature of OP, complications are very rare. Possible complications described in the literature are osteosarcoma, giant cell tumor and chondrosarcoma. Diagnosis is usually established with simple X-ray imaging. MRI may aid in differential diagnosis in more complicated cases, showing multiple circular or ovoid hypointense lesions located in proximal or distal epiphyses. In addition, radionuclide bone scan (scintigraphy) can also help distinguishing OP from osteoblastic bone metastases, but abnormal bone scan does not exclude OP. Bone scintigraphy demonstrates usually absence of radiotracer uptake in OP patients. Since the condition is inherited, a family study should be done. Being asymptomatic and treatment is unnecessary.

Conclusion
Since the benign bone lesions of osteopoikilosis may mimic the bone metastases and could easily be mistaken for metastatic disease, it is important that physicians be aware of the benign nature of this condition.

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References