

Demographic Profile of Endocrine Disorders in Patients Admitted in Endocrinology Ward, Services Hospital Lahore

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Abstract

Objective: To find out frequency and demographic profile of endocrine disorders in patients admitted in endocrinology ward at Services Hospital Lahore.

Methods: The cross-sectional study was conducted at Services Hospital Lahore in Punjab, Pakistan. The study included 105 patients admitted in Endocrinology Ward. Data used was secondary and it was collected via medical record from June, 2018 to January, 2019. All information pertaining to patients was kept confidential. Ethical Review Committee permission was undertaken with final approval from Head of Department.

Results: Demographic characteristics of patients included age, gender, and showed majority to be middle-aged females. The number of female cases were 65.71% (n = 69), while male cases were 34.29% (n = 36). The average age of all the patients was 40.62 ± 16.52. Majority of the patients with 76.19% (n = 80) cases were reported with having glucose homeostasis disorders with 65.71% (n = 69) cases having diabetes mellitus and 10.48% (n = 11) with hypoglycemia. Pituitary gland disorders comprised 8.57% (n = 9) of the cases with 5.71% (n = 6) diagnosed as pituitary tumors and 2.86% (n = 3) as hypopituitarism. Pituitary tumors further included Cushing syndrome with 4.76% (n = 5) cases and acromegaly with 0.95% (n = 1). Hypopituitarism comprised of hypocortisolism with 1.90% (n = 2) cases and Sheehan's syndrome with 0.95% (n = 1). 7.62% (n = 8) cases were reported with having thyroid disorders, with 4.76% (n = 5) having hyperthyroidism and 2.86% (n = 3) with hypothyroidism. 4.76% (n = 5) cases were diagnosed as sex hormone disorders comprising puberty disorders with 1.90% (n = 2) cases, fertility disorders with 1.90% (n = 2) and turner syndrome (inherited disorder) with 0.95% (n = 1). Calcium homeostasis disorders with 1.90% (n = 2) included one case each of parathyroid adenoma (parathyroid gland disorder) and osteoporosis (metabolic bone disease).

Conclusion: The research indicated that glucose homeostasis disorders constituted highest in frequency, followed by pituitary gland disorders, thyroid disorders, sex hormone disorders and calcium homeostasis disorders. The current study urges us to act collectively in order to prevent endocrine disorders which can be done by promoting public education programs, proper counseling about its preventive measures and undergoing periodic medical examination.

Key Words: Demography, Endocrine disorders.

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Introduction

Endocrine system is a system of specialized glands called endocrine glands that secrete hormones into the blood and via blood travel to tissues and organs all over the body.^{1,2} The endocrine glands consist of pineal, pituitary, thyroid, parathyroids, thymus, adrenals, pancreas, ovaries and testes.³ Endocrine system, together with the nervous system, acts as the body's communication network. The functions of endocrine system include growth and development, metabolism, sexual development, sleep, hunger, and electrolyte balance.^{4,5}

Endocrine disorders result due to dysfunction of

endocrine glands, leading to either lack or excess of hormone synthesis, secretion and transport. Excessive action may be due to tumors secreting excess hormone, resetting of normal feedback loop, antibody mediated stimulation or excess hormone ingestion. A lack of hormone effect may result from a lack of hormone, caused by genetic deletions, damage to the endocrine gland or lack of a synthetic enzyme. Additionally, the hormone receptor may be structurally abnormal and inactive leading to hormone resistance.^{6,7}

Physiologically, endocrine disorders can be broadly classified into five main types, i.e. glucose homeostasis disorders, pituitary gland disorders, thyroid disorders, sex hormone disorders and calcium homeostasis disorders.^{8,9} Glucose homeostasis disorders include diabetes mellitus and hypoglycemia. Diabetes mellitus can be classified into three main types, which are Type-I diabetes mellitus, Type-II diabetes mellitus and gestational diabetes mellitus.⁶ Pituitary gland disorders consist of diabetes insipidus, pituitary tumors, hypopituitarism and Cushing syndrome.¹⁰ Thyroid/parathyroid disorders are classified into hyperthyroidism, hypothyroidism, thyroiditis, thyroid carcinoma, hyperparathyroidism and hypoparathyroidism.^{11,12} Sex hormone disorders include inherited genetic disorders like Turner syndrome and Klinefelter syndrome, disorders of sex development, hermaphroditism, delayed maturation, amenorrhea, hypogonadism and multiple endocrine neoplasia.¹³

According to Golden SH (2009), prevalence estimates in the United States revealed that endocrine disorders account for at least 5% of the total adult population. The most prevalent conditions in adult patients were osteopenia (47%) in men and (39.6%) in women, metabolic syndrome (34 - 39%), low HDL-cholesterol (37%), obesity (19 - 32%), hypertriglyceridemia (30%), impaired fasting glucose (7 - 26%), diabetes mellitus (6 - 22%), erectile dysfunction in males (18.5%), impaired glucose tolerance (17%), hypercholesterolemia (17%), osteoporosis (7.2%) in women and (6%) in men and thyroiditis (5%).¹⁴ According to a study carried out by Anyanwu AC et al. (2013), at a tertiary care hospital in Nigeria, endocrine disorders comprised of 174 (10.2%) out of 1703 medical cases. The most common endocrine disorders were hyperglycemic crises with 75 (43.1%)

cases, followed by diabetes mellitus foot syndrome with 33 (19.0%), hypoglycemia with 23 (13.2%) and diabetes mellitus related co-morbidities with 33 (19.0%) cases.¹⁵

In Pakistan, adequate knowledge regarding frequency and causes of common endocrine disorders is lacking. According to Raza SA (2011), there still has not been enough data collected on this subject to provide our doctors with appropriate guidelines to manage common endocrine disorders.¹⁶ More researches are required to provide physicians with adequate knowledge, guidelines and estimates about endocrine disorders. In current scenario, this study is carried out to explore about the frequency and demographic characteristics of patients admitted in Endocrinology Ward at a tertiary care hospital in Lahore, Pakistan.

Methods

The cross-sectional study was conducted at Services Hospital Lahore in Punjab, Pakistan. The study included 105 patients admitted in Endocrinology Ward. Data used was secondary and it was collected via medical record from June, 2018 to January, 2019. Non-probability, convenient sampling method technique was used. Patients admitted in male, female and high dependency unit (HDU) wards were included in the research, whereas those patients who were admitted only for testing of oral glucose tolerance test (OGTT) in pregnancy were excluded from the study. All information pertaining to patients was kept confidential. Ethical Review Committee permission was undertaken with final approval from Head of Department.

The demographic characteristics included age and gender. Gender was divided into two groups (males and females), while age was divided into four intervals. The endocrine disorders were divided into glucose homeostasis disorders, pituitary gland disorders, thyroid disorders, sex hormone disorders, calcium homeostasis disorders and others. Data was entered and analyzed using SPSS software. Frequencies and percentages were used for qualitative variables like gender, whereas means and standard deviation were used for quantitative variables like age.

Results

The demographic characteristics of patients included their age and gender with majority of patients being middle-aged females. The number of female cases were 65.71% (n = 69), while male cases were 34.29% (n = 36). The average age of all the patients was 40.62 with a standard deviation of ± 16.52 (Table 1). Concerning frequency of endocrine disorders, majority of the patients, 76.19% cases (n = 80), were reported with having glucose homeostasis disorders, with 65.71% cases (n = 69) having diabetes mellitus and 10.48% cases (n = 11) with hypoglycemia. About 48.57% cases (n = 51) had Type-II diabetes mellitus, 10.48% (n = 11) with type-I diabetes mellitus and 6.67% (n = 7) with gestational diabetes mellitus.

7.69% (n = 8) of the cases were reported with having

Table 1: Demographic Profile of Endocrine Disorders

Characteristics	Age Intervals	Frequency	Percentage
Age in years	0 – 20	18	17.14 %
	21- 40	33	31.43 %
	41- 60	47	44.76 %
	> 60	7	6.67 %
Average Age	40.62\pm16.52		
Gender	Male	36	34.29 %
	Female	69	65.71 %

thyroid disorders with 4.81% (n=5) having hyperthyroidism and 2.86% (n = 3) with hypothyroidism. Pituitary gland disorders comprised 8.57% (n = 9) of the cases with 5.71% (n = 6) diagnosed as pituitary tumors and 2.88 % (n = 3) as hypopituitarism. Pituitary tumors further included Cushing syndrome with 4.81% (n = 5) cases and acromegaly with 0.95% (n=1). Hypopituitarism comprised of hypocortisolism with 1.90% (n=2) cases and Sheehan's syndrome with 0.95% (n=1). Thyroid disorders constituted 7.62% (n = 8) of the cases with 4.76% (n = 5) having hyperthyroidism and 2.86% (n=3) with hypothyroidism. Sex hormone disorders comprised of puberty disorders with 1.90% (n = 2) cases, fertility disorders with 1.90% (n = 2) and turner syndrome (inherited disorder) with 0.95% (n = 1). Calcium homeostasis disorders with 1.90% (n = 2) included one case each of parathyroid adenoma (parathyroid gland disorder) and osteoporosis (metabolic bone disease)(Fig 1 and Table 2).

Table 2: Frequency (n) of Endocrine disorders

Endocrine Disease	Types and Subtypes	Frequency (n)	Percentage (%)	
Glucose Homeostasis Disorders (n = 80)	Diabetes Mellitus	Diabetes Mellitus Type-I	11	10.48 %
		Diabetes Mellitus Type-II	51	48.57 %
		Gestational Diabetes Mellitus	7	6.67 %
		Hypoglycemia	11	10.48 %
Pituitary Gland Disorders (n = 9)	Pituitary Tumors	Cushing Syndrome	5	4.76 %
		Acromegaly	1	0.95 %
	Hypopituitarism	Hypocortisolism	2	1.90 %
		Sheehan's Syndrome	1	0.95 %
Thyroid Disorders (n = 8)	Hyperthyroidism	5	4.76 %	
	Hypothyroidism	3	2.86 %	
Sex Hormone Disorders (n = 5)	Puberty Disorders	Premature Puberty	1	0.95 %
		Delayed Puberty	1	0.95 %
	Fertility Disorders	Amenorrhea	1	0.95 %
		Polycystic Ovarian Syndrome	1	0.95 %
	Inherited Disorders	Turner Syndrome	1	0.95 %
Calcium homeostasis disorders (n = 2)	Parathyroid Gland Disorder	Parathyroid adenoma	1	0.95 %
	Metabolic Bone Disease	Osteoporosis	1	0.95 %
Others (n = 1)	Carcinoid Syndrome	1	0.95 %	
Total (n)		105	100 %	

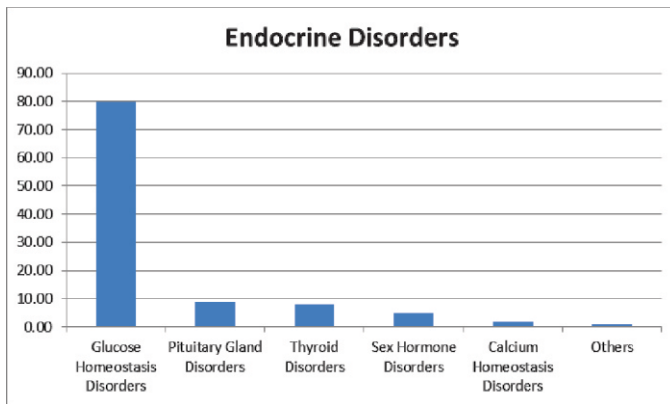


Fig-1: Bar Chart Showing Frequency of Endocrine Disorders in Participants

Discussion

Endocrinology is a field that needs adequate attention in Pakistan. The prevalence of diabetes and metabolic syndromes are on the rise. Early detection is vital in effective controlling of diabetes. The commonest approach for testing diabetes is via screening which is a semi-quantitative test for glucose in a urine sample followed by oral glucose tolerance test.¹⁷ For pituitary disorders, important measures include continuous monitoring for anthropometric indicators associated with metabolic and cardiovascular comorbidities as well as body satisfaction.¹⁸ For thyroid disorders, primary preventive measures include proper iodine nutrition, smoking recession and preventing alcohol intake.¹⁹ Calcium and Vitamin-D deficiency is also becoming an irritating problem in the masses leading to many calcium homeostasis disorders. Calcium balance should be maintained in the body by proper intake of calcium nutrients met with Vitamin-D supplements and exposure to sunlight. Protein intake has shown to enhance calcium absorption. Sodium and potassium in the diet also effects calcium nutrition. High sodium intake increases urinary calcium excretion whereas high potassium intake helps in decreasing calcium excretion, especially in postmenopausal women.²⁰ More researches are needed about different endocrine disorders to adequately manage these public health problems.^{21,22}

The current study indicates that there is a high prevalence of glucose homeostasis disorders, among which diabetes mellitus constituted the majority, similar to studies reported by Golden SH(2009) and Sarfo-kantanka O (2017). It also showed similarity with respect to frequency of thyroid disorders and pituitary disorders.^{14,23}

As far as gender ratio is concerned, the present study showed a lower male to female ratio of 36:69 (34.29 % males), showing disparity compared to studies done by Sarfo-kantanka O (2017 Ghana) and Feldman AL (2017, Sweden), but similarity on comparison with study done by Ale AO (2019, Nigeria).^{23,24,25} Research study indicated dissimilarity as far as ratio of thyroid disorders is concerned with hyperthyroidism cases more frequent than hypothyroidism (4.76% to 2.86%) as compared to 1.6% to 1.8% in a study done by Stone MB (2003).²⁶

Conclusion

This research indicated that glucose homeostasis disorders constitute as highest in recurrence, followed by pituitary gland disorders, thyroid disorders, sex hormone disorders and calcium homeostasis disorders. The frequency and demographic results of this study can be applied for future studies as a support for ongoing further research based on endocrine disorders. The current study also urges us to act collectively in order to prevent endocrine disorders, which can be done by promoting public education programs, proper counseling about its preventive measures and undergoing periodic medical examination. This specialization area needs to be tackled with scientific evidence and guidelines for control of modifiable factors of these disorders.

Author's Contribution:

MMA: Conceptualization, Methodology, Investigation, Analysis, Resources, Validation, Writing, Review & Editing

ND: Conceptualization, Project Administration, Supervision, Investigation, Analysis, Review & Editing

AAR, NM, NR: Supervision, Investigation, Analysis, Review & Editing

TZ: Supervision, Investigation, Resources, Analysis, Validation, Review & Editing

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