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ORIGINAL ARTICLE

Spectrum of Paediatric Endocrine Disorders: Experience from Bangladesh Shishu Hospital & Institute

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Abstract

Background: *Paediatric endocrine disorders (PEDs) are on rising and assumed to be due to changing lifestyles, environmental pollutants, growing awareness, and improved diagnostic tools. Like developed countries, these noncommunicable diseases are coming forward day by day in our country warrant attention of health professionals.*

Objective: *To describe the pattern and burden of Paediatric Endocrine Disorders that existing in recent years in our country.*

Methods: *This is a descriptive, cross-sectional study conducted in Department of Paediatric Endocrinology & Metabolic Disorder including Indoor & OPD clinic of Bangladesh Shishu Hospital & Institute, Dhaka, Bangladesh over 4 years from January 2020 to November 2023. Data has been reviewed from previous records, noted on a format and analyzed using SPSS version 25.*

Results: *Out of 645,058 new cases, a total of 3530 patients were seen at Endo-OPD with PEDs, accounts for 0.55% and 421 (11.9%) number of endocrine cases have been managed in indoor. Among admitted cases 224/53.2% male in contrast to 197/46.8% were female with ratio of 1.1:1, majority originates from urban area about 238/67.2%. The most common age of presentation was 1 to 5 years 35.9% though age ranged between 1st week to 18 years. Number of patients increased gradually from 2020 to 2023 with maximum on 2023, in OPD 1432/41% and indoor 200/49% cases. According to the International Classification of Pediatric Endocrine Diagnoses (ICPED) classification, combinedly calcium, phosphate metabolism and bone disorders were maximum (115/27.3%), and Vit D deficiency Rickets comprises 70% of them. But solely the top five admitted PEDs cases were thyroid disorders (82/19.47%), Rickets (77/18.3%), Adrenal gland disorders (48/11.4%), Obesity (42/9.9%) and short stature 38/9.0%. OPD case distribution of 2023 showed same pattern like majority were thyroid disorders 45.5%, followed by Rickets 13.54%, Adrenal disorder 7.33%, obesity 7.19% and Down syndromes with endocrinopathies 6.25%.*

Conclusion: *Thyroid disorders, rickets, adrenal disorder and obesity ranked highest among the PEDs in our setting. There is a need to raise awareness of PEDs among healthcare professionals and the general population to improve early presentation to the clinic.*

Keywords: *Paediatric endocrine disorders, Spectrum.*

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Introduction

Endocrine disorders affect different systems of the human body.[1] Pediatric endocrinology involves diagnosis and treatment of disorders of endocrine glands with its target organs, metabolic systems, in children and adolescents. Globally the burden and pattern of Pediatric endocrine disorders (PED) are increasing, attributable to changing lifestyles, environmental pollution and improving diagnostic capabilities.[2] The field is rapidly evolved in the last few decades as a result of major advancement and resulting in different specialization within the field. PED comprise a wide range of conditions including disorders of growth and puberty, thyroid function, sexual development, disorders of the adrenals, glucose metabolism, calcium and bone metabolism as well as obesity and its complications etc.[3] Tropical diseases, infectious diseases and disease related to nutrition are still the leading causes of morbidity and mortality in children in developing country like us. But hormonal and metabolic disorders has been contributing to increase disease load are remained unnoticed earlier, and time has come to give information. We have lack of widespread national program of newborn screening for metabolic diseases and have insufficient data regarding this field. However, interestingly the subject is advancing rapidly over the years in our country.

The objective of this study is to provide a recent image of the spectrum of endocrine disorders in pediatric population in Bangladesh. We conducted a retrospective study by reviewing the cases managed under the Department of Pediatric endocrinology and Metabolic disorder, Bangladesh shishu Hospital and Institute, Dhaka over past 4 years.

Materials and Methods

Bangladesh Shishu Hospital & Institute is a tertiary care hospital for children (around 700 beds) with a post graduate academic wing, situated at Dhaka, Bangladesh. Department of Endocrinology & Metabolic disorder has been running for more than a decade, comprises both indoor and OPD clinics. Patients with suspected endocrine disorders, referred from all over the country and from inhouse other departments, get admitted in ward and receive treatment according to standard protocol. OPD clinic runs once in a week that covers only endocrine cases attended by junior and senior consultants along with resident students of Endocrine Department. The study was a retrospective study that conducted by collecting 4 years data of hospital admission and OPD clinic, from the hospital's register book and departmental records, since January 2020 to November 2023. Demographic data, including age at presentation, gender, address were noted. Diagnosis that established based upon clinical features, laboratory workup were obtained and recorded in a structured proforma. Facilities for radiological and bio-chemical investigations were available at the hospital laboratory. Special hormonal assay & serological investigations were carried out at other private laboratories of international standards to fill in the gap, as the hospital did not have the all facilities. Cases were classified by using the ICD-10, based on the International Classification of Paediatric Endocrine Diagnoses (ICPED) system. Data were analysed by using Statistical Package for Social Sciences (SPSS) version 25 and arranged following R programming.

Results

A total number of 645,058 new paediatric cases were visited in Medicine OPD and 3530 cases were seen at Endocrine OPD clinic over the last 4 years accounting for 0.55% of total. Among those 3530 out patients 421 (11.9%) endocrine cases had got admitted for evaluation and management.

Table I
Demographic data of indoor cases (n= 421)

Factors	Frequency	Percentage
Sex		
Female	197	46.8
Male	224	53.2
Residence		
Rural	138	32.8
Urban	283	67.2
Age distribution		
0-1 month	27	6.5
>1 month- <1year	103	24.5
1-5 Year	155	36.8
>5-<10 Years	79	18.7
10-<14 Years	42	9.9
>14	15	3.6

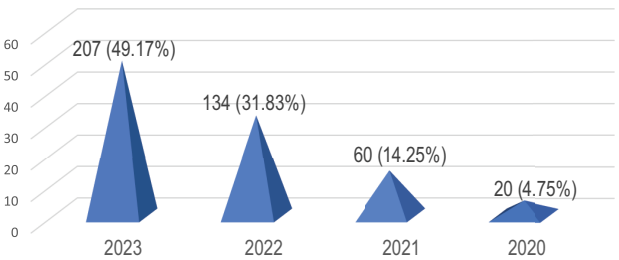

Fig.-1 *Yearly distribution of admitted cases (N=421)*

Table II

Pattern of Endocrine cases according to the ICPED sub-classification managed at indoor over 4 years (n=421)

Name of Disorders	Frequency (Percentage)	Name of Disorders	Frequency (Percentage)
Adrenal Disorder	**48(11.4)**	**XY DSD**	**21 (4.99)**
Primary Adrenal Insufficiency	4(0.95)	Testosterone Bio Synthetic Defects	4(0.95)
Congenital Adrenal Hyperplasia	40 (9.5)	CAH (Sex steroid synthetic defect)	7(1.66)
Adrenal Tumor	4(0.95)	Hypospadias	3(0.71)
Sex ratio (F:M)	32:16	Hypogonadotropic hypogonadism	4(0.95)
Mean age (years)	0.875000±2.513425	Gonadal dysgenesis	3(0.71)
Costo - Chondral Diseases	**21(4.9)**	Sex ratio (F:M)	1:20
Achondroplasia and variant	8(1.9)	Mean Age (Years)	1.571429±2.248809
Metaphyseal chondro-Dysplasia	1(0.24)	**Short Stature**	**38 (9.0)**
Morquio Syndrome	3(0.71)	Constitutional delay of growth and puberty (CDGP)	9(2.14)
Other forms of MPS	6(1.43)	Familial short stature (FSS)	3(0.71)
Osteogenesis imperfecta (OI)	3(0.71)	Growth Hormone Deficiency (GHD)	11(2.61)
Sex ratio (F:M)	8 : 13	Hypothyroidism	6(1.43)
Mean Age (Years)	2.843750±3.399330	Idiopathic	1(0.24)
Syndromic disorder	**5(1.19)**	Turner syndrome (TS)	8(1.9)
Hypocalcemia	**38(9.0)**	Sex Ratio (F:M)	23 : 15
Vitamin D deficiency	23(5.46)	Mean Age (Years)	7.023256±4.317673
Congenital Hypoparathyroidism	10(2.37)	**Rickets & Mimics**	**77(18.29)**
Hypomagnesemia	5(1.18)	Ca+ deficiency Rickets	3(0.71)
Sex ratio (F:M)	25 : 13	Vitamin D deficiency Rickets	54(12.8)
Mean_Age (Years)	5.020833±5.313530	Renal BMD	2(0.48)
Disorder of Glucose metabolism	**6(1.43)**	RTA	4 (0.95)
T1DM	4(0.95)	VDDR1 Rickets	6(1.43)
T2DM	2(0.48)	VDDR2 Rickets	4 (0.95)
Sex ratio (F:M)	1 : 5	Toddlers bowing	2(0.48)
Mean_Age (Years)	9.250000±3.201562	Familial Hypo phosphatemic Rickets	2(0.48)
Thyroid Disorders	**82(19.47)**	Sex Ratio (F:M)	26 : 51
Auto Immune Thyroiditis (AIT)	10 (2.37)	Mean Age (Years)	2.532468±3.405044
Congenital Hypothyroidism	67(15.91)	**Puberty Disorder**	**28 (6.65)**
Goitrous hypothyroidism	2(0.48)	Central Precocious. P (CPP)	11(2.66)
Thyrotoxicosis	3(0.71)	Peripheral Precocious. P(PPP)	8 (1.9)
Sex ratio (F:M)	51 : 31	Premature thelarche	3 (0.71)
Mean_Age (Years)	3.747126±5.005156	Premature adrenarche	1 (0.24)
MPHD (Multiple Pituitary hormone deficiency)	**1(0.24)**	Delayed puberty	5 (1.18)
		Sex ratio (F:M)	18 : 10
Obesity	**42(9.98)**	Mean_Age (Years)	4.210526±2.417045
Exogenous Obesity with metabolic disorder	12(2.85)		
Cushing syndrome (CS)	12(2.85)	**Posterior Pituitary disorder/ Polyuria & Polydipsia**	**12(2.85)**
Hyperinsulinemia	2(0.48)	AVP deficiency or CDI	8(1.9)
Monogenic obesity	9(2.14)	AVP Resistance or NDI	2(0.48)
Prader-Willi syndrome	7(1.66)	Primary Polydipsia	2(0.48)
Other syndromic Obesity	2(0.48)	Sex ratio (F:M)	4: 8
Sex ratio (F:M)	19: 23	Mean Age (Years)	5.000000±4.898980
Mean Age (Years)	5.166667±4.438834	**Autoimmune Polyglandular Syndrome type 3**	**2(0.48)**
		Sex ratio (F:M)	2: 0
		Mean Age (Years)	6.000000±4.242641

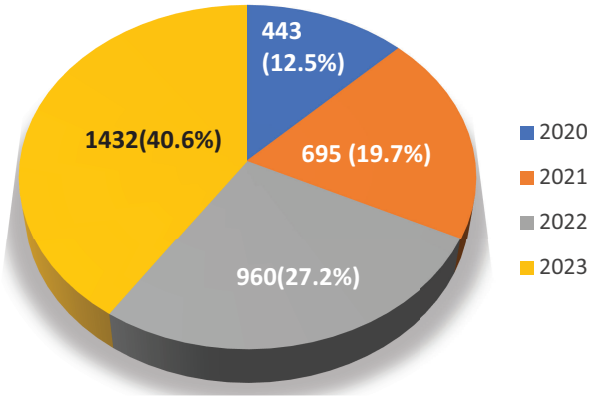

Fig.-2 *Distribution of cases attended at Endocrine OPD Clinic from 2020 to 2023 (N=3530)*

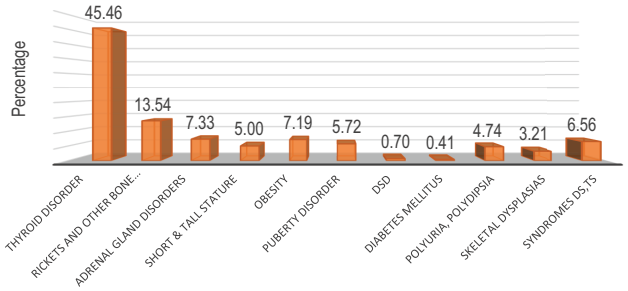

Fig.-3 *Frequency of Endocrine disorders attended at OPD clinic over the year 2023 (n=1432)*

According to Table I, maximum admitted patients came from urban area 283(67.2%) in comparison to rural 138 (32.8%) and male 224(53.2%) predominance had seen than female 197(46.8%) with male female ratio of 1.1 :1. We also found that among admitted cases children of ages 1 to 5 years were top most majority 155(36.8%), then infants were in second position 103(24.5%) , subsequently >5-<10 years old child 79(18.7%), 10-<14 years old 42(9.9%), neonate 27(6.5%) and pubertal age >14 years old 15(3.6%) patients. Less number of patients got admitted in first 2 years 2020 to 2021, (20) 4.7% and (60)14.25% accordingly due to covid pandemic, which were increased 3-4 folds on following years 134(31.83%) in 2022 and 207 (49.17%) in 2023 (Fig.-1). In OPD clinic total 3530 number of Endocrine cases were seen in between 2020 to 2023 and displayed same trend of increase in number of cases over 4 years were like 443 (12.5%) patients in 2020, 695(19.7%) in 2021, 960 (27.2%) in 2022 and 1432 (40.6%) in 2023 (Fig.-2).

Admitted cases were evaluated and classified according to International Classification of Paediatric Endocrine Diagnoses (ICPED) system. Among the cases, highest a total number of 115 patients (27.3%) had Calcium and Phosphate metabolism disorder manifested as either rickets 77 (66.9%) or hypocalcaemia 38 (33%). Vitamin D deficiency was the major cause 70% (54) of Rickets followed by calcium deficiency 3.8% (3), six (7.7%) cases of VDDR1, VDDR2 four cases(5.1%) and rests were familial hypophosphatemia, CKD BMD, Toddles bowing 2 (2.5%) each admitted in study period with male predominance (F:M- 0.5 :1) . Among 38 cases of hypocalcaemia vitamin D deficiency found in 23(60%) children, primary hypoparathyroidism 10(26.3%) and hypomagnesemia in 5(13.1%) patients (Table II**)**.

Thyroid gland disorders was the second largest disorder in children found in 82 (19.47%) cases where females were more affected (F:M -1.6:1). Still congenital hypothyroidism was the commonest cause 81.7% (67), subsequently autoimmunity 8(9.7%), thyrotoxicosis 5 (6.0%) and 2 (2.4%) cases of goitre were detected with mean age of presentation was 3.74± 5.00 years. Forty-eight children (11.4%) had adrenal disorder among them 32 were girl double of boys (F:M-2:1), who had congenital adrenal hyperplasia CAH of different variety in 83.3% (40) cases and primary adrenal insufficiency and adrenal tumour detected in 8.3% (4) cases each. Forty-two (9.98%) obese child had got admitted for evaluation with mean age of 5.16±4.43 years. Cushing syndrome and exogenous obesity with metabolic disorders of same number of cases 12 cases 28.5% each were the leading cause of admission. Genetic causes of obesity like monogenic 9 (21.4%) and PWS 7 (16.6%) cases (Table II).

The next common endocrine disorder showed in Table II was short stature presented by 38 (9.0%) cases, of them Growth Hormone Deficiency 11(30%) and CDGP 9(23.6%) were the most common cause behind. Turner syndrome 8(21.0%), hypothyroidism 6(15.7%) and familial short stature also played important role to become short in children.

Other important endocrine disorders in Table II were puberty disorder 24(5.4%), differentiation of sexual development XYDSD 21(4.99%) and glucose metabolism disorder like DM in 6(1.43%) cases. Sexual precocity specially both central and peripheral causes were the highest 79.1% (19 cases) cause of puberty disorder both in female and male (F:M-3:1). Three (12.5%) patients with Premature thelarche and a patient of premature adrenarche also diagnosed

in this period. Four cases of T1DM and two cases of T2DM were managed within this period. Among DSD cases sex steroid synthetic defect (CAH) 7(33.3%) and Testosterone biosynthetic defect 4(19%) were found to be more than others like hypogonadotropic hypogonadism 4(19%), hypospadias and gonadal dysgenesis 3 cases each 14.2%, where XX to XY ratio 1:20. Other less frequent but important genetic endocrine disorders that addressed were costochondral disorder or skeletal dysplasia of 21(4.9%) cases. Achondroplasia and its variant 8 (38%) patients, Mucopolysaccharidosis 9 patients 42.8% and Osteogenesis Imperfecta 3 (14.2%) cases were managed. Among 12 cases of posterior pituitary disorder AVP deficiency diagnosed in 8 (66.67%) case, AVP resistant and primary polydipsia 2 cases each. Autoimmune polyendocrine syndrome two and Multiple pituitary hormone defect (MPHD) found in 1 case.

Among cases that visited at OPD clinic in the year 2023 described in major headings according to ICPED classification, total 1432 cases were divided into 11 category, among them thyroid disorders comprised majority 45.46% followed by rickets 13.54% and adrenal disorder 7.33% in second and third position. Like indoor, patient presented as short stature 5.0% cases, obesity 7.19% and puberty disorder 5.72% had various causes behind, evaluated and managed in OPD without need to get admit. A fair number of syndromic children especially down syndrome with various endocrinopathies 6.56% managed as outpatient. Other endocrinopathies as DSD 0.7%, DM 0.41% , Disorder of Post Pituitary gland AVP disorder 4.74% and skeletal dysplasia 3.31% were detected and managed in OPD (Fig.-3).

Discussion

Paediatric endocrinology is a highly attractive area for clinicians and Scientists and the field is evolving rapidly in our country too. Our hospital is a well reputed largest pediatric hospital within the country and the "Department of Endocrinology and Metabolic disorder" has been serving for more than a decade. The OPD clinic covers only endocrine cases referred from General (Medicine) OPD, OPD of other specialty and also from other hospital over the country. This is a retrospective study of past four years from 2020 to 2023, out of 645,058 pediatric patient total 3530 number of patients accounts for 0.55% visited Endocrine OPD clinic & only 421 patient 11.9% got admitted. However, majority were managed at OPD basis reflected that the emergency is much less frequent in this specialty. In the study, male was little predominant than female with the ratio of (1.1:1) which has similarity with other study of this area shown 1.4:1[1] but dissimilar to other study from different countries where females are more.[2,4-8] More than two third 67.2% of patients came from urban and rest from rural area, may be the awareness of disease and early identification is less in rural areas. Though the commonest age of presentation was 1-5 year were 35.9% but infant was 24.8% and lowest presenter were adolescent 3.6% with range of prestation from 1st week of life to 18 years of age, because some disorder like hypoglycemia, hypocalcemia, DSD, Adrenal disorders especially genital ambiguity or salt crisis presented at neonatal age[9,10] on the other hand puberty disorder or autoimmune endocrinopathies presented at latter age. Yearly distribution of both indoor and OPD cases shown same trend of rising on later 2 years 2022 to 2023 than previous two years due to Covid-19 pandemic when patients movement were limited. This study found that a total 1432 cases were visited at OPD in the year of 2023 which was three times more than Covid period and more than 200 patients or 414% of them needed admission on that year represents the actual disease load at present time. Still, we have limited data about present situation at national level from this area.

Endocrine cases were distributed following ICPED sub-classifications.[11] In Bangladesh Shishu Hospital & Institute the five leading endocrine disorders found to be in children were thyroid disorder 19.47%, rickets 18.29%, obesity 9.98%, adrenal disorders (11.4%), short stature (9.0%) and Vitamin D deficient hypocalcemia, had shown similar data like majority (27.4%) thyroid disorders followed by simple obesity (25.9%) and short stature (21.5%) study from another hospital of BD [1] but dissimilarity found from other developing countries of Africa reported by Nasir et al[12] where DSD, DM, genital ambiguity were prioritized. But in our country DSD, Puberty disorders, Disorder of glucose -lipid metabolism, Arginine -Vasopressin disorders, Genetic Costo-chondral diseases were comparatively less common. However, some endocrine disorders such as hypothyroidism, goiter are more common in females due to the presence of estrogen receptors in the thyroid gland, similarly in adolescence, autoimmune

thyroid disorders such as Grave's disease chronic lymphocytic thyroiditis, puberty disorders, poly-endocrinopathies are also more common in girls than boys.[7,9,13] Adrenal disorders specially CAH is also detected more in girls due to an early presentation of genital ambiguity in comparison to salt losing variety of male sex that clearly depicted in our study, same as other study of this area.[1]

In this study, thyroid disorder was the major cause of admission in which congenital hypothyroidism comprises three fourth portion of total number, in a setting where newborn screening is not routinely carried out. Average age of presentation was 3.747±5.005 years, F:M ratio 1.6:1. A neonatal Grave's disease presented as growth failure, 2 cases of neonatal goiter due to dyshormonogenesis were managed. On the other hand, peri-pubertal onset of Autoimmune thyroiditis 9.7 %, thyrotoxicosis 6% case and a fair number of physiological goiters also managed. Our study consistent with other studies[7,14] where congenital hypothyroidism was more and a Study from other center also showed majority 27.4% were thyroid disorder.[1]

Second commonest disorder was Rickets 18.29% of 421 cases including nutritional and non-nutritional causes, having male predominance F:M-1:1.9. Frequency of admission of Rickets were less in comparison to OPD attendance because it is a non-emergency disease except hypo calcemic seizure. Vitamin D deficiency was the major cause 70% of nutritional rickets though some cases were manifested as hypocalcemia 23 (5.46% of total) without bone changes. Our statistics is compatible with other study from Nigeria[15] stated about 11.8%, from Niger 12.1%[7] and Egypt 12%[16] of total endocrine cases were rickets. The most attributable factors were may be covid-19 pandemic & post covid consequences[17,18] indoor lifestyle due to social insecurity, urbanization etc. In current review, calcium deficient rickets were less frequent 3.8 % and non-nutritional causes like CKD BMD, Renal tubular acidosis (RTA) were found less number because most of these cases were managed by well-organized Nephrology Department. Genetic rickets like VDDR1- 7.7%, VDDR2- 5.1% and Familial Hypophosphatemic rickets 2.5% were diagnosed by clinical and serological workup but majority had absence of genetic testing (with few exceptions) due to less availability of testing and high cost. Bowing of limbs with difficult walking were the commonest presentation of 1 to 5 years old child and outcome was excellent in more than 90 percent cases with standard Vit D supplementation. Few cases were presented like rickets but later on diagnosed as physiological bowing. Among hypo-calcemic patients primary hypoparathyroidism were 26.3% and Hypomagnesemia 13.1%, were diagnosed and managed.

Adrenal disorders come next, 48 cases that comprises 11.4% of total which was another disease that female presented more 2:1 and undoubtedly genital ambiguity was the classic presentation that brought the female cases in focus. It's a social emergency of raring of gender most of the time the cause for which parents rushed into hospital at neonatal age. Male child were presented more with salt wasting variety less in neonatal age but more in post neonatal infancy. Some simple virilized variety were came at childhood with precocity. Data from other study varies due to addressing of disease under different entity like some addressed as DSD[9,13] in some study as precocious puberty. In this study CAH due to enzymatic steroidal synthetic defect found in 40(>80%) cases though defective muted gene was not detected in majority cases. Steroid was the only supplement that provided to patient. Other causes of adrenal disorders were Primary adrenal insufficiency and Adrenal tumor 4 cases each, were identified and treated. Cushing syndrome were counted under obesity.

Like others, obesity become the newly emerging calorie disorder of this developing country that covers around 10% (42 cases) of total endocrine disorders where calorie excess or exogenous obesity was the leading cause 12 cases . Multiple metabolic disorders like HTN, NAFLD/Fatty liver disease, Dyslipidemia, Insulin resistance were associated co-morbidities that leaded to admission. It was 7.6% in 2002 and 17.9% in 2006 among children in Dhaka city.[19] Previous two studies among Bangladeshi school children of 6 to 15 years aged children found the prevalence of obesity and overweight was 3.5% and 9.7% respectively.[20] Similar higher prevalence were seen in other study where obesity includes 9.2% of all PEDs[15], 11% reported by Tamunopriye et al[21] and more than 11.2% reported by Onyiriuka et al[7]. During and after the pandemic, lifestyle has changed like decreased in outdoor play/exercise, an increased

in the number of online classes, more time spent using gadgets/electronic devices, alteration in sleep patterns and the possible increase in consumption of junk food resulted in weight gain for many individuals-children and adults too. In our study child with Cushing syndrome of both exogenous and endogenous origin, were the next maximum number of obesity, more than one fourth admitted for evaluation. Rest of 40% patients were Genetic obese like Prader Willi Disease 7 patients with two were genetically proven (Chromosome 15 deletion), 9 cases of Monogenic obesity among them one had MCR4 mutation and another had POMC gene mutation , others were diagnosed clinically without genetic evidence due to financial constrain. Hyper-insulinemia found in 2 infants came with hypoglycemia and overweight, and lastly obesity in syndromic association (BBS) detected in 2 patients. Modification of life style & dietary habit, regular exercise along with management of co-morbidities were the cornerstone of Calorie excess obesity management. Specific drug Setmelanotide for Monogenic obesity is not available in our country.

Short stature is an important issue for seeking of medical attention among parents for their child in our country. About 9% of total children were proportionately short and 4.9% were detected as disproportionate short child or having genetic causes of Costo-chondral disorders, combinedly 14.9% were being short. Aitafo et al found 5.9% of total children[15] and Al Ghamdi et al showed quite high prevalence of 23.7% cases of growth failure among all cases[22], variable with our study. Average age of presentation was prepubertal 7.023± 4.317 years where girls being more affected than boys, ratio 1.5:1, because some diseases like Turner syndrome and juvenile hypothyroidism, predominantly occurred in girls who were presented with growth failure mostly same as other study from Bangladesh and India.[23, 24] Growth hormone deficiency in 30% cases, CDGP (Constitutional delay in growth and puberty) more than 25%, Turner syndrome in 25% case and Acquired hypothyroidism 15%, were the main causes of proportionately short child with 3 cases of Familial short stature. Study from other institute found 37.9% had hypothyroidism followed by familial short stature (27.6%) results were differ from us because we didn't congenital hypothyroid child in short stature group. Another study from BSMMU showed FSS 51%, CGDP 14%, hypothyroidism 12%, GHD 8%, malnutrition 6%, genetic syndrome 5%[24], report varies from center to center. This result is consistent with a study done in India[23] where genetic causes were in second common position. Eight patients of Achondroplasia, including 3 patients of Morquio syndrome total nine patients of MPS, diagnosed only by clinical symptoms due to limited facility of genetic testing, were managed in our ward. Three patients of Osteogenesis Imperfecta has been treating with Bisphosphonate.

The percentage of cases of Glucose metabolic disorders were found to be low <2% in our study, including T1DM & T2DM total 6 patients took treatment from our department during the study time frame out of them 2 patient had DKA initially became passive later. A study from BIRDEM showed that the prevalence of diabetes was 0.3% with prevalence of type 1 diabetes was 0.2% and type 2 diabetes was 0.07% in school going children in BD.[25] From other centers around the country, most of the Diabetic patients referred to a Diabetic specialized hospital, situated at Dhaka, the reason of less referral of DM at our center. But in some center Africa DM is the commonest endocrine disorder.[2,7]

The current study showed that in Table II, 5.4% child admitted for Puberty disorder, girls 3 times more than boys with common age of presentation 4.210± 2.41 years. Complete or central cause of precocity found in majority 60% cases, most were idiopathic origin of CPP in girls and few boys found having hypothalamic hamartoma and pituitary adenoma , were treated with Gonadotropin releasing hormone (GnRh) agonist Inj. Leuprolide Acetate. Similar data found in another study of BD[1] , 3.6% reported by Ghamdi et al[22] but more shown by Aitafo et al 10.1%[15], Zhang et al[26] 11.53%. In this study peripheral cause of precocious puberty detected in 16 % children, most of them had CAH and 2 cases had adrenal tumor. Three patients of Premature thelarche 12% and a case of Premature Adrenarche kept under follow up, though high number of premature thelarche 60% seen in other study.[27] Among delayed puberty group few were Turner Syndrome that mentioned under short child and a patient with other cause had treated with puberty induction.

In our setup, XY DSD were quite low 4.9%, only 21 patients were admitted for evaluation, which was high in other study from Africa illustrated as second common endocrine disease[7], 10.9% by Aitafo et al[15]

, 9% by Tamunopriye et al[21]. In the present study, the cases of CAH with genital ambiguity had considerd as XX DSD and described under CAH, so the percentage became lower than other study who considered CAH, Turner as DSD[1] dissimilar to us mentioned at[7]. Among 21 cases of our center one third had sex steroid synthetic defect or CAH, rest were testosterone biosynthetic defect 20% and hypogonadotropic hypogonadism 4 cases 20%, 3 cases of hypospadias with cryptorchidism or PIAS and 3 cases of gonadal dysgenesis 14% each were detected.

Arginine vasopressin (AVP) disorders found in 2.8% cases mostly seen in male patient who were presented with polyurea and polydipsia. About two third had AVP deficiency managed with desmopressin, 2 cases were Nephrogenic DI due to underlying tubulopathies treated under Nephrology Department. Two cases of primary polydipsia had no underlying cause identified, remained under regular monitoring.

Two adolescent girls with Autoimmune polyglandular syndrome type II and a case of Multiple Pituitary hormone deficiency had diagnosed and treated accordingly.

The frequency of endocrine cases visited at Endocrine OPD clinic over last year 2023, a total 1432 number of cases were come for different endocrine problems representing the perception of knowledge about the endocrine disorders among medical field and social arena of this territory. Among cases Thyroid disorders comprised 45.5% near to half of total patients represents the necessities of neonatal thyroid screening scheme. Rickets specially vitamin D deficiency was found as second common cause was 11.5% about one tenth who were manifested as limb deformity in majority cases reflected the sedentary life style that adopted in covid-post covid period should be changed. Adrenal disorders manifested as genital ambiguity, salt loosing crisis, sexual precocity were 7.3% came for evaluation. 7.1% of overweight patient attended at OPD for management, becoming a global problem. A huge number of patients of Down syndrome 6.5%, referred to OPD to exclude endocrine associations could properly manage. Growth failure 5%, puberty disorder 5.7%, Genetic skeletal deformity 3.21 and DSD 0.7% patient referred to our OPD. Polyuria -polydipsia in 4.74% case and 0.45% case with hyperglycemia/ DM came for evaluation over the year 2023.

The study is limited by its retrospective design, duration and being single-centred.

Conclusion

Thyroid disorder, rickets, short stature, adrenal disorder and newly emerging obesity ranked highest among the PEDs at our setting. Providing of proper knowledge about diet, healthy lifestyle, health education among children and adolescents is the time demanding mandatory intervention to reduce the load of non-communicable diseases like DM, HTN. It is now an urgent need to raise awareness about PEDs among healthcare professionals and the general population too, to improve early detection & early referral to clinic. There is a need for policymakers to make health strategies that prioritise screening tests and to make investigations, management of Paediatric endocrine disorders accessible, affordable and feasible.

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