# STUDY OF CLINICAL PROFILE OF PATIENTS WITH SHORT STATURE VISITING A TERTIARY CARE HOSPITAL

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**ABSTRACT**

**BACKGROUND**
Short stature is one of the common causes of referral of children to endocrine unit. It may result due to various causes and elucidating the exact cause is necessary to formulate the right therapy.

**OBJECTIVE**
To study the various aetiologies and clinical presentation of patients presenting with short to a tertiary care hospital.

**DESIGN**
Cross sectional study

**MATERIAL AND METHODS**
We collected and analysed the clinical, biochemical, radiological and hormonal data of 104 consecutive patients who presented to our department from January 2015 to March 2016 for evaluation of short stature.

**RESULTS**
Majority of the subjects studied belonged to 10-15 years group (44.23%) followed by 5-10 years age group (31.73%). The most common cause in our population was due to familial short stature (29.80%). The next common causes included chronic medical illness (23.08%) followed by hypothyroidism (13.46%). Majority of patients presenting for evaluation of short stature were males (60.58%).

**CONCLUSIONS**
Short stature is caused due to a multitude of causes. In our population, familial short stature was the most common aetiology.

**KEYWORDS**
Short Stature, Familial Short Stature, Growth Hormone Deficiency.

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**INTRODUCTION:** Normal growth in a child requires a complex and coordinated interplay between nutritional factors and multiple hormones involved in this pathway. Dysregulation in any of these factors in the critical period of child growth can lead to loss of final height. The major hormones that are involved in maintenance of growth are growth hormone (GH), insulin like growth factor (IGF-1), thyroid hormone, sex steroids and other growth factors.[1]

Short stature poses a significant psychological burden not only to the child but to the parents as well. Clinically, short stature is defined as height below 3rd percentile or below 2 standard deviations (SDs) of the median height for that age and sex according to the population standard; or even if the height within normal percentile but growth velocity is consistently <25th percentile over 6 to 12 months of observation.[2,3] The causes of short stature are quite different in developing countries to that of developed one. We have under taken this study to ascertain the estimated frequencies of various disorders causing short stature in children in our population.

**MATERIAL AND METHODS:** All consecutive patients presenting with short stature to Endocrinology OPD of SCB. Medical College, Cuttack from January 2015 to March 2016 were enrolled in the study.

A detailed clinical evaluation including detailed history taking was carried out for all patients. The evaluation of short stature was undertaken as per standard protocol. A detailed drug exposure history was also undertaken. Anthropometric measurements and puberty staging was done (as per Marshall and Tanner classification). Patients were followed every 3-6 months interval for anthropometry

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assessment. Data were collected on age, sex, parental heights, and the age of puberty for each parent. Complete blood count, ESR, renal function test, liver function test, serum calcium, serum phosphorous, serum alkaline phosphate, serum vitamin D, thyroid function tests, stool examination and urine analysis were done. Bone age radiographs were also done in all the subjects. Biochemical and hormonal evaluation and pituitary imaging (if required) were done.

Written and informed consent was taken from each subject. Institutional ethical committee clearance was taken. The data was analysed using standard statistical methods. The graphs and tables were generated using Microsoft Excel 2007 software.

**RESULTS:** A total of 104 patients visited Endocrinology OPD for evaluation of short stature during the entire study period. Among them, 41 were females whereas the rest were males (figure 1). Majority of the patients belong to 10-15 years of age group (44.23%) followed by 5-10 years of age group (31.73%) (Figure 2). We also found that (13.46%) of patients presented to us after 15 years of age, which could be due to poor knowledge among parents and delayed health seeking pattern.

The mean age of presentation was 10.41±3.87 years. The mean age of presentation among males was 10.09± 3.91 years and among females was 10.88±3.76 years respectively. Most common cause of short stature was familial short stature which accounted for 29.80% of cases (n=31) (Figure 3). This was followed by chronic medical illness group which had 23.08% of cases (n=24). The major chronic illnesses (n=24) presenting with poor growth included renal disease (n=5), haematological diseases (n=5), diabetes mellitus (n=9) and coeliac disease (n=2). A significant number of patients having short stature due to underlying hypothyroidism (13.46%) and constitutional delay in growth (CDG) which accounted for 7.69% of cases. Turner's syndrome which is an important cause of short stature in girls accounted for 1.92% of total cases. The other causes of short stature included skeletal dysplasia (4.80%), rickets (1.92%), pituitary disorders (4.80%) including multiple pituitary hormone deficiency (MPHD) (1.92%), growth hormone deficiency (GHD) (2.88%) and renal tubular acidosis (RTA) (0.96%) (Figure 3).

**DISCUSSION:** Short stature is one of the common endocrine disorders encountered in clinical practice. It could be the manifestation of several underlying pathologies. Identifying the exact cause is necessary for treating and achieving the best outcome. The majority of patients belong to 10-15 years age group (44.23 %) which is similar to study of Bhadada et al [4] who reported maximum cases to be in 13-18 years of age group (50.5%). The mean age of presentation in our study was 10.09±3.91 years for males and 10.88±3.76 years for females. Gutch et al[5] reported the mean age of male and female patients to be 11.65%±3.2 years and 11.78±3.1 years respectively.

Males constituted of 60.58% of cases in our study whereas Singh et al[6] and Bhadada et al[4] reported the same figure at 55% in respective studies. The previous studies have also reported boys outnumbered girls in growth retardation studies.[1,7]

The most common cause in our study was familial short stature (FSS) (29.80 %), Bhadada et al[4] reported FSS to be present in 15.9% of cases where as Gutch et al[5] reported the same to be around 16% in respective studies.

Constitutional delay in growth (7.69 %), chronic medical illness (23.08%) and hypothyroidism (13.46%) accounted for the rest bulk of patients. Skeletal dysplasia accounted for 4.80 % of cases. Rare causes of short stature in our study included pituitary disorders which included GHD (2.88 %) and MPHD (1.92 %), rickets (1.92 %), Turner's Syndrome (1.92 %) and RTA (0.96%). We classified the rest of the patients in the miscellaneous group (11.54%) who could not be diagnosed or were classified as idiopathic.

In the study by Bhadada et al, the causes of short stature included hypothyroidism (14.2%), GHD (7.4%), Turner's syndrome (7.4%), panhypopituitarism (1.1%) and chronic medical illness (12.4%). In a similar study conducted by Gutch et al in North India, the author reported causes of short stature as follows hypothyroidism (8.6%), GHD (2.4%), panhypopituitarism (1.7%), Turner's syndrome (1.3%) and chronic medical illness (10.6%). Previous studies have reported that endocrine causes account for 20-30% of all short stature causes.[7,8,9]

**CONCLUSION:** Familial short stature is the most common aetiology seen in our study group. Short stature should be thoroughly evaluated to establish the exact cause. Treatable conditions should be identified at the earliest so that proper therapy can be administered and optimal height could be attained.

**ABBREVIATION:**

GH-Growth Hormone.
IGF-1-Insulin like Growth Factor 1.
SDs-Standard Deviations.
CDG-Constitutional Delay in Growth.
MPHD-Multiple Pituitary Hormone Deficiency.
GHD -Growth Hormone Deficiency.
RTA-Renal Tubular Acidosis.
FSS-Familial Short Stature.

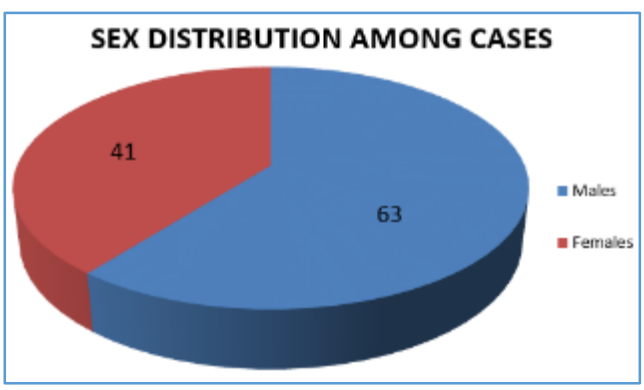


***Fig. 1: Pie Chart depicting Sex Distribution of Cases***

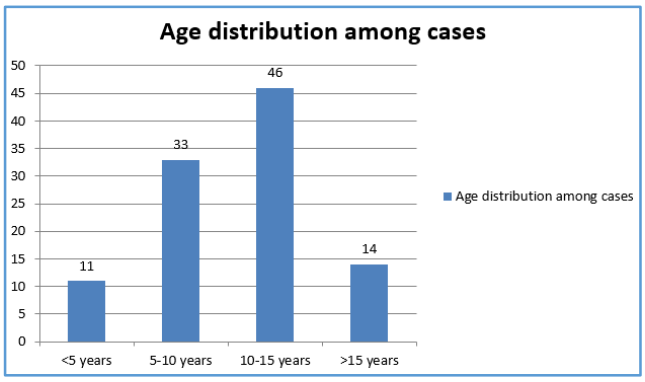


***Fig. 2: Graph showing Age Distribution among Cases***

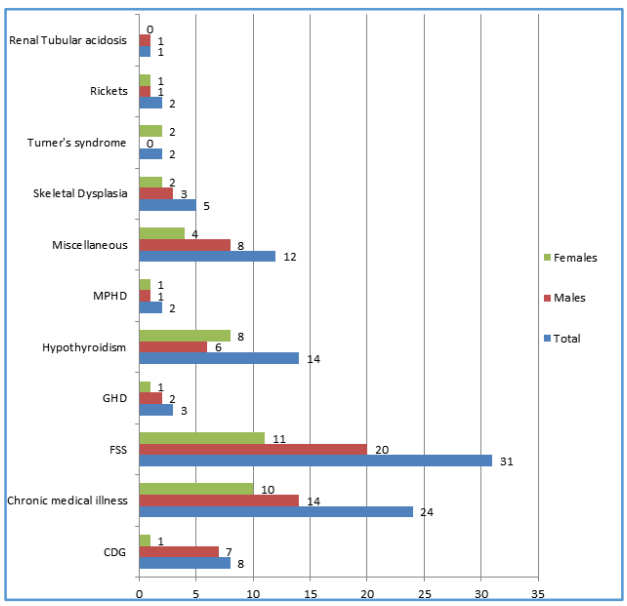


***Fig. 3: Aetiology of Cases Presenting with Short Stature***

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