safe, adverse events are reported. Though the circumstances promoted the shift to home based therapy, we wonder if the preparedness is adequate.

The bi-annual surveillance with clinical examination and blood and radiological investigations were missed by all twenty-six patients. As the therapy is relatively new, expensive, with stringent storage requirements, management is through tertiary care centres and primary care physicians are mostly not involved in patient treatment and follow-up. This lack of experience and awareness at the peripheral health centres impacted local management for these patients.

This study highlights pertinent aspects of interruption to care, anxiety and concerns of patients and their families with chronic genetic disorders, and the limitations of a tertiary care centric management for chronic disorders. The emerging role of telemedicine as an important tool for follow up and care of patients with chronic disorders is important. As we strive to increase access to ERT, we recognize the need to equip peripheral centres for care of patients with genetic disorders along with consultation with tertiary centres.

As the pandemic continues, we still grapple without guidelines to manage chronic genetic disorders. There is an urgent need to draw the attention of medical authorities to facilitate multi-specialty care for these patients to prepare for similar unforeseen situations.

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Appropriateness of Lower Waist Circumference Cutoffs for Predicting Derangement in Metabolic Parameters Among Asian Children and Adolescents: A Pilot Study

Waist circumference (WC) >90th percentile cut-off effectively screens children for metabolic syndrome, as some specific metabolic derangements (high fasting serum levels of insulin and triglycerides) may be better associated with lower (70th percentile) waist circumference cut off. We evaluated a subset of children and adolescents found obese or overweight following the anthropometric screening in a school-based survey. Metabolic parameters (fasting insulin levels, fasting blood sugar and fasting lipid profile and blood pressure) were compared among 3 groups of obese or overweight children divided on the basis of WC percentiles (>90th, 70th-90th and <70th). 78 children (aged 11-18 years, 45 boys) were evaluated. The proportion of participants with high triglycerides and fasting insulin among those with WC<70th (28.6%, 19%) was significantly lower than that in the group with WC >90th (76.9%, 53.8%) as well as in group with WC 70th-90th percentile (38.7%, 41.9%).

Keywords: *Anthropometry, Blood sugar, Central obesity, Overweight, Triglycerides.*

Obese children from south Asian region are relatively more prone to develop components of metabolic syndrome [1]. Waist circumference is a widely accepted and practical tool for community screening of obesity [2]. However, certain concerns have been raised over the cutoff being used while utilizing waist circumference as a predictor of metabolic syndrome [3,4]. We explored the suitability of lower waist circumference cutoff

(70th percentile, WC70) relative to standard (90th percentile, WC90) for screening components of metabolic syndrome among children and adolescents.

The study was performed at a tertiary care teaching institute in Northern India between October, 2015 and March, 2017 as a part of a school-based survey. Students aged between 9 and 18 completed years from four schools catering to middle and upper middle class population (2 private and 2 government managed) were screened for anthropometric parameters. Those found to be obese or overweight were enrolled if parents provided informed consent. Study was performed following approval from Institute ethics committee as well from school administration.

Children were screened for height (portable stadiometer, IndoSurgicals) and weight (Omron HN-286 digital weight scale). Waist circumference was measured at midpoint between the lowest rib and the iliac crest in a horizontal plane after complete expiration by using non-elastic tape to the accuracy of 0.1 cm. Fasting blood samples were collected at school and assessed using colorimetric method (Beckman Coulter AU 680) for blood sugar and lipid profile. Fasting insulin was measured as an additional metabolic marker [5]. Blood pressure was measured thrice using mercury sphygmomanometer and regional reference data was used to define hypertension [6]. The components of metabolic syndrome were recorded as WC90 along with presence of 2 or more of the following: Hypertriglyceridemia >150 mg/dL, high density lipoprotein (HDL) cholesterol <40 mg/dL, high blood pressure >90th percentile and fasting blood glucose >100 mg/dL [7].

The sample size was as per availability, since the number of participants with parental consent for invasive procedure was expected to be limited. Statistical analysis was performed using IBM SPSS version 20. The data from the participants who were screened for metabolic syndrome was divided into three groups based upon waist circumference (>WC 90th, 70th-90th percentile and <WC70) as per IAP reference data [8]. The proportion of children with derangement in various metabolic parameters were compared among the groups.

Among 1958 children screened for anthropometric parameters, 24.6% boys (8.5% obese) and 22.9% girls (7.8% obese) were either obese or overweight as per BMI criteria. Parents of only 78 (aged 11-18 years, 45 boys) of 469 obese/overweight children provided consent for blood sampling. When these 78 participants were divided on the basis of waist circumference percentiles, 26 had >WC90 (group I), 31 had waist circumference between 70th-90th percentile (group II) and 21 had <WC70 (group III). The number of participants with obesity were 19, 17 and 16, respectively among the group I, II and III.

The WC >90th percentile significantly differentiated children with high diastolic BP as well as those with two or more deranged parameters from others (**Table I**). However, both group I and II had similar proportion of participants with high triglycerides (TG) and high fasting insulin, which was significantly higher compared with group III.

Table I Proportion of Participants With Deranged Metabolic Parameters Among Groups Divided on the Basis of Waist Circumference Percentiles

Parameter	*Group I (n=26)*	*Group II (n=31)*	*Group III (n=21)*
High systolic BP	13 (50)	9 (29)	8 (38.1)
High diastolic BP[a]	6 (23.1)	2 (6.5)	2 (9.5)
High fasting blood glucose	9 (34.6)	6 (19.4)	5 (23.8)
High triglycerides[b]	20 (76.9)	12 (38.7)	6 (28.6)
Low HDL	20 (76.9)	21 (67.7)	15 (71.4)
High LDL	13 (50)	13 (41.9)	5 (23.8)
≥2 components of MS[c]	23 (88.5)	16 (51.6)	11 (52.4)
High fasting insulin[d]	14 (53.8)	13 (41.9)	4 (19)

Value in number (%). BP: blood pressure; LDL: low density lipoprotein; HDL: high density lipoprotein; aP: for group I vs group II; P=0.045; bP= for group I+II vs group III, P= 0.017; cP=for group I vs group II; P=0.001; dP=for group I+II vs group III, P=0.012; Participants divided based on waist-circumference >90th centile (Group I); 70th - 90th centile (Group II) and <70th centile (Group III).

The presented data indicate that though WC >90th percentile cutoff effectively screen children for metabolic syndrome, some specific metabolic derangements (high fasting serum levels of triglyceride and insulin) may be better associated with lower (70th percentile) waist circumference cutoff.

In a recent systematic review, it has been concluded that waist circumference has better accuracy than BMI in predicting clustered cardiometabolic risk factors [9]. However, some studies points towards few gaps in the knowledge about its utility as a screening tool. Horlick and Hediger emphasized on the need to explore various waist circumference cutoff points while evaluating metabolic syndrome in different population groups [3]. A recent cross sectional analysis involving more than 6000 adolescents explored the appropriateness of using different waist circumference percentile cut of points for predicting various metabolic syndrome parameters. The optimal waist circumference percentile to identify youth with elevated insulin was 92nd and that to identify youth with ≥3 risk factors was 85th [4]. Using the unconventional WC cut off, we noticed the proportion of participants with high triglycerides and fasting insulin among those with WC<70th (28.6% and 19%) was significantly lower than that in the group with WC >90th (76.9% and 53.8%) as well as in group with WC 70th-90th percentile (38.7% and 41.9%). Though derived from small number of participants, this novel interesting finding deserves further systematic exploration with better designed studies. Our findings suggest that 70th percentile of waist circumference may be more sensitive in predicting derangements in serum insulin and triglyceride level than 90th percentile.

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Utility of Body Mass Index Quick Screening Tool for Assessing Nutritional Category of Children

Body mass index (BMI) quick screening tool was used on retrospective data of 415 boys and 428 girls (8-14 years). Sensitivity and specificity of the BMI tool were assessed by comparing with the Indian Academy of Pediatrics BMI charts. The BMI tool had high sensitivity and specificity to identify children with normal BMI and underweight. However, its sensitivity varied between 50-57.4% for overweight and obese children, respectively.

Keywords: *Growth chart, Underweight*

The double burden of malnutrition, defined as the simultaneous manifestation of both undernutrition and overweight and obesity, has increased in most low-income and middle-income countries [1]. It is important to identify both undernutrition and overnutrition so that preventive and corrective measures can be implemented at the earliest.

The Indian Academy of Paediatrics (IAP) Revised Growth Charts 2015 are recommended for assessment of growth in children between 5-18 year of age and provide body mass index (BMI) charts to screen for under or over-nutrition [2]. In a busy paediatric practice, it has been observed that weight and height are recorded but BMI is overlooked as it is not calculated [3]. This poses a risk of missing undernutrition, overweight and obesity which if undiagnosed have serious consequences on the health of the child.

Recently gender-specific BMI quick screening tool (children ≥8years) [4] has been developed which overcomes this problem of computing the BMI. The child can be identified as underweight, normal weight, overweight and obese by plotting the weight and the height. The present study was planned to assess the utility of this BMI quick screening tool in terms of sensitivity and specificity by comparing with the Revised IAP BMI charts.

The BMI tool [4] was used as per the recommendation on the retrospective data of children and adolescents in the age group 8-14 years (unpublished data). The height and weight were plotted on X-axis and Y-axis, respectively. The meeting point of the two lines gave the BMI. Depending on where the BMI point rested, the child was classified as being obese, overweight, normal BMI or underweight. BMI was also calculated and plotted on the IAP BMI charts [2], and nutritional status identified.

Statistical analyses were conducted using SPSS version 26 (SPSS Inc). Frequency (percentage) of underweight, normal BMI, overweight and obesity were calculated using BMI quick-screening tool and Revised IAP BMI chart. Sensitivity and specificity of the BMI quick-screening tool against IAP charts were calculated.

Data on 843 (415 boys) children and adolescents were analyzed. The mean (SD) age of boys and girls was 10.8 (1.7) and 10.8 (1.6) years, respectively. According to BMI quick-screening tool, 9.88% of boys were underweight, 72.87% had normal BMI, 12.05% were overweight and 5.3% were obese. As per IAP BMI charts, the percentage of boys with underweight, normal BMI, overweight and obesity was 4.34%, 68.67%, 18.55%, 8.43%, respectively. According to BMI