Reference Charts Of Body Proportion For Bangladeshi Infants (Boys And Girls)

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Abstract: There are several studies that reported percentile curves of stature for the assessment of growth in Japanese children (Murata et al, Murata 2002).Stature, an index of skeletal growth of the whole body, is a projected distances, reflecting the length of the head, neck, trunk and lower limbs.Growth patterns of the head neck, trunk and lower limbs are different from one another Satake et al.1994,). The longitudinal growth study of Bangladeshi Infants from zero to four years of age the data have been collected from primary steps which involve in human growth study. Data from this studies provided the mean values of body proportions for each age group of Bangladeshi (sample as Rajshahi City) Children, but not the standard curves describing the distribution.

Keywords: Infant, Stature, Sitting height, Sub ischial Leg length, Upper lower ratio, proportion.

1.Introduction:

In Bangladesh, stature or full length, weight, chest circumference, sitting height and other dimensions of the every child have been measured at regular intervals. In addition to those variables themselves, ratios using the measurements such as sitting height ratio (=sitting height/ stature×100), skelic index(=stature-sitting height)×100, and (stature –sitting height)/ stature(Tanner et al.1982,Malina and Bouchard 1991, Ogawa et al. 1991, Ashizawa (2002) estimated that the information on body shape and proportion. Konishi (1990) estimated that between 1949 and 1986, the age at peack growth velocity of subischial leg length (=stature-sitting height) got progressively younger, although the analysis was based on cross- sectional data and the estimated age was crude. Ashizawa (2002) reported that until the 1970s, the Japanese became taller because of increasing leg length.However, body proportion has remained

unchanged since the 1980s, especially among young males, whereas in young females, leg length relative to stature continues to increase, if only a little.

But,now we are only representing about the stature and leg length of infants(0-1)and childs(1-3) years of old.The data from the longitudinal growth studies provided the mean values for each age group of healthy and thin children, but not standard curves describing the distribution(including the medians) of body proportions at different ages for male and female of Bangladeshi children.The curves allow the monitoring of an individual's change of proportion from the period of infant to childhood.In this present study, we constructed reference percentile curves of the ratio of sitting height and subischial leg length.

Objectives: The objectives of the study was to construct a chart of body proportion of children (girls and boys) in Bangladesh. now we are only representing about the stature and leg length o infants(0-1)and childs (1-3) years of old.The data from the longitudinal growth studies provided the mean values for each age group of healthy and thin children, but not standard curves describing the distribution(including the medians) of body proportions at different ages for male and female of Bangladeshi children. The curves allow the monitoring of an individual's change of proportion from the period of infant to childhood.In this present study, we constructed reference percentile curves of the ratio of sitting height and subischial leg length.

The aim of the study was to construct a chart of body proportion of children(girls and boys) in Bangladesh.

2.Research Methodology

Materials and Methods:

2.1.Study Design

All infants in Bangladesh at Rajshahi City among the specimen under this study were measured and recorded regularly, the samples were collected randomly from selected eight clinic and hospitals which situated at Rajshahi City in Bangladesh. About 300 of the infants of each gender

and 0-4 years of age group were sampled. Thus the sample size for each gender in that age group was total 296, where female infants number was 134 the male infants number was 162.

2.2Predictor variable

By taking measurement of Stature/ Full length, Sitting height, Subischial Leg length it can be determine the upper and lower ratio of 296 infant and children. Below are the concept of those terms.

2.3Stature/ Full length: Until infants second birth day, children stature are measured supine, and after that standing up to four years of age by a soft tap which sketching by c.m. By laying vertically situation touches a big scale with the top of the head and at the same time at the ending of the foot touching with a scale as a parallel way.The distance between top of head up to feet is called stature. Lightly pressure should be sufficient to compress the soft tissue upon the knee.

2.4 Sitting height: The children sits on the table with the legs hanging unsupported over the edge of the table and with hands resting on the thighs in a cross handed position.The knees are directed straight ahead.It is also measured by measuring tap .The distance from the highest point of the head in the mid-sagital plane to the ending point of sitting position.

2.5 Subischial Leg length:Leg length is calculated by subtracting sitting height from total height or stature.Though it have found from the upper-lower ratio calculations or curves.In japan, this leg length was calculated differences between height of spina ilica anterior superior measured by Martin's method and subischial leg length (stature-sitting height) in Japanese girl's and boy's 6-17 years old reported by Matsumoto et al.(1990) increased with age.

3.Methods

About 296 infants of Rajshahi City who was born was randomly selected from pre seleced clinic/hospitals during the period of data collection for long six months which is included in this study.The percentile curves of full length/Stature and sitting height both of male and female children have been calculated from their mean values of percentiles for each individual age groups. The upper lower ratio (ULR) was calculated height divided by sitting height from their individual age groups from 0-48 months. After then, from the various age groups of ULR we

have calculated their percentiles respectively. By using statistical correlation it found very nicely significant.

4.Statistical Analysi

The measurements were carried out from May,2002 to December 2002.Therefore, for example, the age group 'O.5' means the age of the group is more than 'O' and less than 2.Accordingly collected data was arranged by this series every after fifteen days such as O,O.5,1,1.5,2,2.5... till to 1 years of age and after then measurement had taken every after 1 month.The longitudinal data provided the distribution of upper/lower ratio (ULR).Eight percentile values were calculated:3rd, 5th,10th,25th,50th ,75th,90th,95th percentiles. All calculations were performed using by SPSS program. Each percentile value was smoothed by a least squares method with the use of a cubic spline function(Ohno et al.1988).Actually, the percentile curves of stature ,sitting height and ULR are originally rather smooth with little fluctuations.
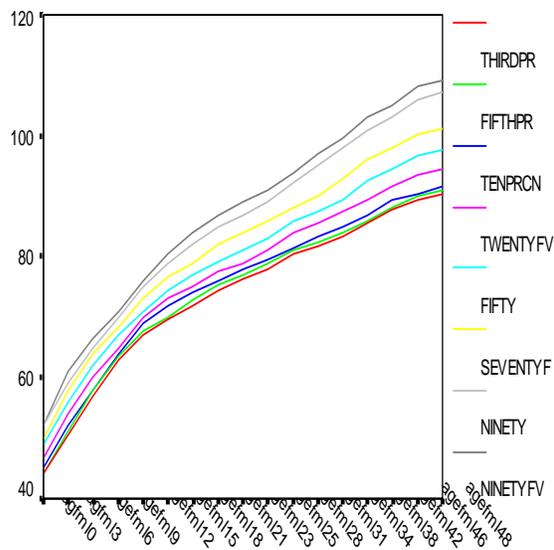
Data analysis:-

Data were entered and analysis was carried out by SPSS for Windows (version 15.0;SPSS,Chicago, III., USA) software package.
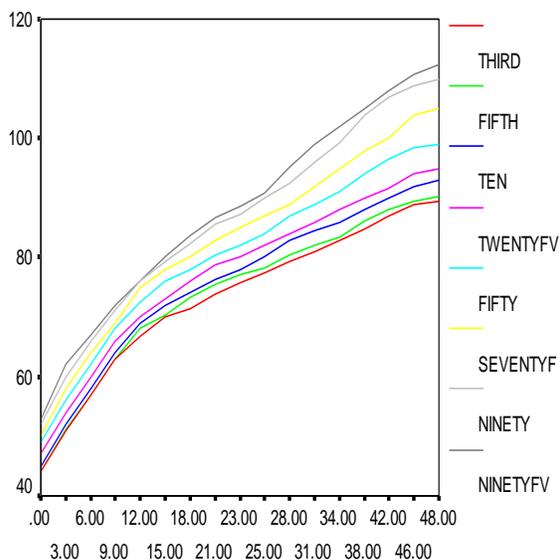
Figure:Percentile Stature Curve of Male children(0-48) months.

Figure:Female Percentile Stature Curve (0-48) month.

Figure1-Stature percentiles curves of Males(Infant).   Figure 2: Stature percentiles curves of Females .

Result / Findings

4.1. Discussion of Percentile Stature both Male and Female children: In this two graph of at the left side horizontal line indicate the measurement of height in c.m. values, vertically children age of months from 0-48 months interval and the right side horizontal line indicates the height percentile values such as 3rd, 5th,10th,25th,50th ,75th,90th,95th percentiles.

The percentile curves for stature, sitting height and are shown in figures 1.2,3, 4 and ULR are in figures 5,6.The increases in percentile values from the 3rd to the 95th for stature or full length and were almost parallel for both sexes through the growth period (O-25) months, that means from at birth to two years of age which called infancy period (figure 1and 2).After 25 months, stature of male infants increased rhythymically and smoothly till to their 48 months with their natural age of course. But in the case of female(infant) growth stature increased highly, rhythymically and smoothly till to their age of 48 months from 1 years. After 2 years of age at female(infant) growth rate became slowly. After 2 years of age male (infant) growth rate improved nicely and highly better than before, till to 48 months of age. It is specially mention that the growth rate of female infants is the most augumented period up to the 25 months of age. Its the peak point of growth during the infancy. After 25 months, the growth rate of male rose sharply till to their 48 monthes of age. On the otherhand during this same period females growth of stature gradually developed but slowly up to the study period.When the 50th percentile curves for stature of male infants are about 99 cm,on the other hand the stature of female infants are about 97.7 cm.The maximum height/ stature of male is about 116 cm and the minimum stature is about 87.5 cm.The maximum height/ stature of female is about 115 cm and the minimum stature is about 83.6 cm.So the males stature were greater than those of same aged females children.
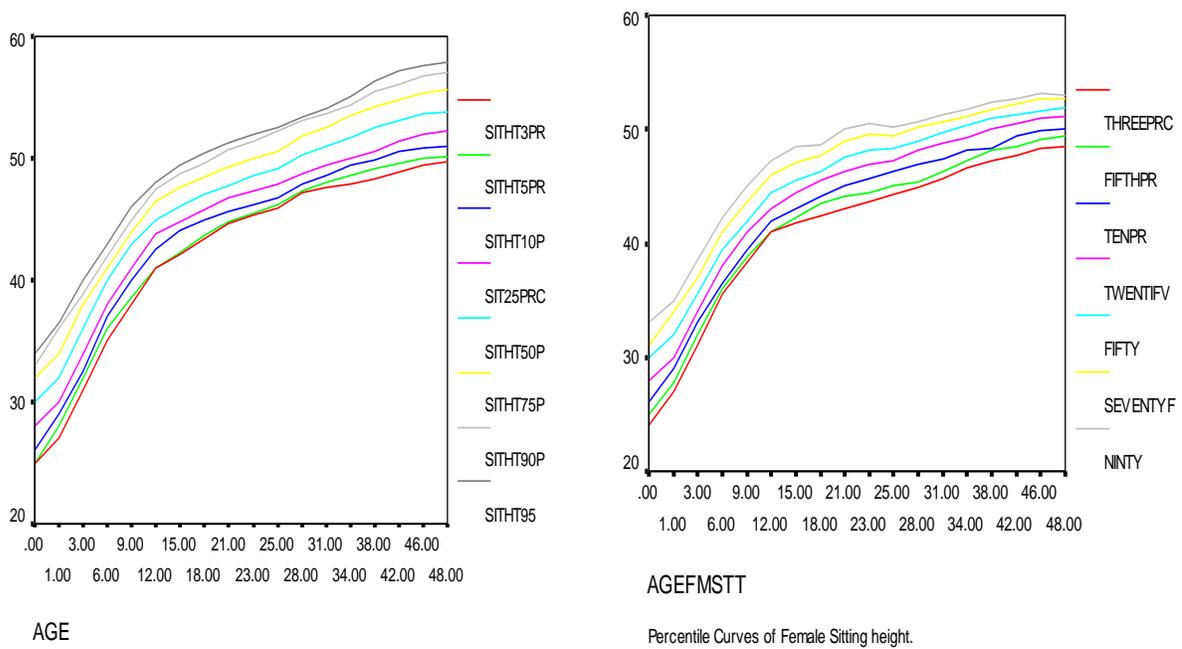
Figure 3: male infants sitting height   Figure 4: Female infants sitting height

4.2. Discussion of Percentile Sitting Height both Male and Female children:

Here in this two figures at the left side horizontal line indicate the measurement of sitting height in c.m.values, vertically children age of months from 0-48 months interval and the right side horizontal line indicates the sitting height percentile values such as 3rd, 5th,10th,25th,50th ,75th,90th,95th percentile

The increases in the percentile values from the 3rd to the 95th for sitting height were almost likely parallel throught the growth period(O-12)months for both sexes of infants.After this period the sitting height rose sharply of male infants.There a little higher growth between a small interval from 12-25 months for female infants. So, before coming this month's from12-25 months above percentiles growth was the most growth period for sitting height for female infants But for both gender the 50th percentile curve gradually upride with the rhythms of time.From 2 years of up to 48 months of age the sitting height curves of male infants increasing randomly and fluently with standard growth rate.But the increases in percentile values from the 3rd to the 95th for sitting height of female infants after 25months of age.Then next growth of female sitting heights percentile growth curve was slowly upride up to age of 48 months.But it has found that after 25 months the females sitting height growth curve of every percentiles became growing smoothly but coparatively lower rate. When the 50th percentile curves for sitting

height of male infants are about 53.8 cm,on the other hand the stature of female infants are about 51.9 cm.The maximum sitting height of male is about 87.5 cm and the minimum is about 49.2 cm.The maximum sitting height of female is about 53.4 cm and the minimum sitting height is about 46.5cm.So the males stature were greater than those of same aged females children.

Subsequently, boys stature and sitting height exceeded those of female infants.When those percentile curves for stature and sitting height were compared for each sex, the stature and sitting height peacked values contained male infants for the same age of female infants.So the peak height and sitting height was lower of female infants of Bangladesh than the boys respectively.
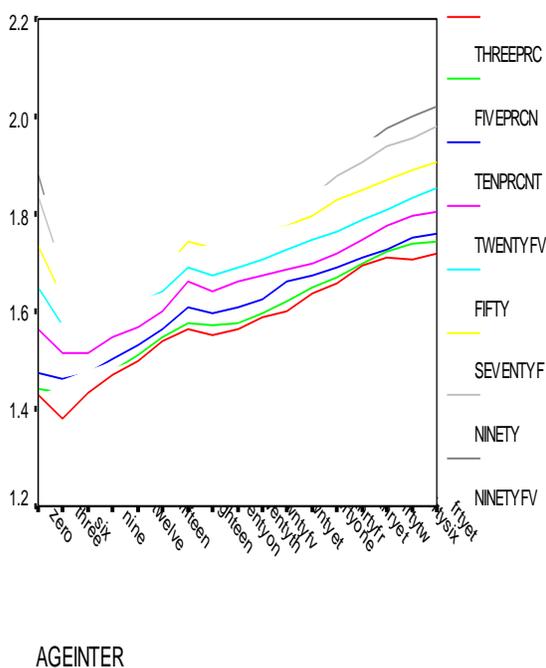

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Figure:Percentile curves of ULR(Upper lower Ratio)Male.
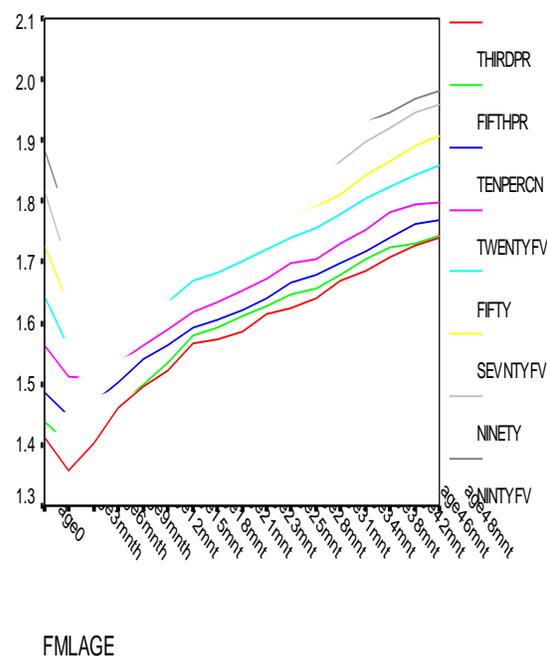

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Figure: Percentile Curve ULR(upper lower ratio) Female children 0-48mnth

4.3.Discription of upper-lower ratio(ULR):

ULR, calculated from the each age of height divided by corresponding sitting height for both male and female children.ULR ratio percentile =stature/sitting height*100.In this two graph of ULR at the left side horizontal indicate the upper lower ratio percentile values, vertically children age of months from 0-48 months interval and the right side horizontal line indicates the ULR percentile values. ULR percentile for male children leg length found lower growth from zero to three months.After this period ULR increased and leg length growth nicely up to eighteen months of age and it's the pick point among at birth to up to this age.The next growth steps of ULR ratio percentile gradually developed till to the study period(48 months of age).Thus, the

tendency toward having longer leg length of male children. The 50th percentile curve for male children declined from 0-3 months of age,after then increasd slightly upto eighteen months of age.Then the curve sharply and smoothly reached at the last study time. The 50th percentile value of male children is 1.65cm at birth and at the age of 48 months is 1.858cm. The maximum value of ULR for male is 2.13 and the minimum value is 1.68.

On the otherhand,Females ULR curves decreased to its lowest value from at birth to three months of age then increased again upto fortysix months.But after then the growth curve some fluctuated.The change in ULR was due to the sitting height and leg length velocities.The period of decline of ULR indicated that leg length increased more than sitting height for female after age of 12 months.But the 95th percentile curve has lower growth tendency for the female children which is forwarding growth for the male children.This tendency of curves proves that towards the coming age the sitting height of female will become gradually lower than male children.The 50th percentile value of female children is 1.64cm at birth and at the age of 48 months is 1.85cm.The sitting height growth tendency become lower at reached to age 46 months of female children.The maximum value of ULR for female is2.07 and the minimum value is 1.73.

5.Conclusion: The leg length growth of female and male children appeared to some diverge reached at the 48 months of age, the difference was clear. The change in ULR was due to the different sitting height and leg length velocities. The period of decline of ULR indicated that leg length increased more than sitting height for both the sexes. Correlation coefficients between ULR and stature were indicating weak relationships at age of 12 month of female children. The rest correlation are nicely significant at the level of 0.01.Except of '0' and 12 month of age, other months significant level is 0.01.But for the male children correlation is nicely significant for all the age group except of '0' month. Particularly the relationships for the boys are more stronger than the girls in their childhood of sitting height and leg length. Thus, the correlation between

ULR and stature in childhood is strongly related to stature in this present study. Probably, after adolescence, the relationships will become stronger with the increasing of age.

Acknowledgements

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