Bone Mineral Density in Cystic Fibrosis: Few Concerns

Gupta, *et al.*[1] published their study on bone mineral density of Indian children and adolescents with cystic fibrosis in a recent issue of *Indian Pediatrics*. I seek following clarifications:

Pubertal development was determined by a self-assessment questionnaire in the study. However, validity of self-assessment of pubertal maturation has shown conflicting results. Tanners' breast, genital and pubic hair classification [2] also did not use self-assessment questionnaire. Rasmussen, *et al.* [3] concluded in their study that breast stage was assessed correctly by only 44.9% of the girls and genital stage by 54.7% of the boys. For pubic hair stage, 66.8% of girls and 66.1% of boys made correct assessments. Girls underestimated, whereas boys overestimated their pubertal staging. Therefore, pubertal assessment by children/ adolescents is not a reliable measure of exact pubertal staging and should be validated by physical examination.

Physical activity level of patients in this study was estimated using Habitual Activity Estimation Scale (HAES) [4]. Was physical activity estimated for controls too? Was there any significant difference? Difference in bone mineral density (BMD) and bone mineral apparent density (BMAD) may be attributable to differences in physical activity levels between patients and controls.

There was no mention of detailed method of calculation of BMD and BMAD. Patient positioning during procedure is a source of error in repeat bone density tests and data are not always reproducible on repeat tests. Study [1] reports significant differences in both BMD and BMAD in patients and controls. As BMD changes with age in children, only BMAD should have been compared.

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References

1. Gupta S, Mukherjee A, Khadgawat R, Kabra M, LodhaR, Kabra SK. Bone mineral density of indian children and adolescents with cystic fibrosis. Indian Pediatr. 2017;54:545-9.
2. Tanner JM, Whitehouse RH. Clinical longitudinal standards for height, weight, height velocity, weight velocity, and stages of puberty. Arch Dis Child. 1976;51:172-9.
3. Rasmussen AR, Wohlfahrt-Veje C, Tefre de Renzy-Martin K, Hagen CP, Tinggaard J, Mouritsen A, *et al*. Validity of self-assessment of pubertal maturation. Pediatrics.2015;135:86-93.
4. Hay JA, Cairney J. Development of the Habitual Activity Estimation scale for clinical research: A systematic approach. Pediatr Exer Sci. 2006;18:193-202.

Authors' Reply

We are thankful to the author for his interest in our study [1]. The concern regarding self-assessment of pubertal growth is well noted. However, many children may not consent for detailed examination, and self-assessment may be acceptable [2]. It may be possible that few of the subjects may have not interpreted their pubertal stage correctly, but the influence of this misinterpretation was assumed to have influenced both the groups equally.

Physical activity level was estimated using HAES only for Cystic fibrosis patients. Several factors such as nutrition, pulmonary function, physical activity, puberty and glucocorticoids affect bone mineral density (BMD) in patients. Therefore, lower physical activity may only be a partly contributing for the difference in BMD and bone mineral apparent density (BMAD) of the two groups.

Due to word limit in main manuscript we were unable to provide details of measuring BMD and BMAD. DXA scan (Hologic QDR 4500A, Hologic Inc., Bedford, MA, USA) was performed of whole body using standard positioning techniques (as mentioned in the manufacturers manual). The measurements taken were: (*i*) Whole body bone mineral content (in g); (*ii*) Whole body bone mineral area (in cm^2); (*iii*) Whole body bone mineral density (in g/cm^2). BMAD was calculated for lumbar spine and whole body using the methods suggested by Katzman, *et al.* [3]. Quality control procedure, which included whole body (Hologic WB # 1252) phantom scanning before subject evaluation, was completed prior to testing on each testing day and it remained stable during the entire study period. In addition to this, short term precision error for the DXA scans was calculated by triplicate measurement of 15 healthy subjects as per the method suggested by Glûer, *et*

al. [4]. Re-positioning of the subjects was done between measurement and single trained technician performed and analyzed all the scans to avoid inter-personnel variations; the person was blinded to the subject's group (Cystic fibrosis/Control). The calculated coefficient of variation of whole body was 1.3% for BMD.

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REFERENCES

1. Gupta S, Mukherjee A, Khadgawat R, Kabra M, Lodha R, Kabra SK. Bone mineral density of Indian children and adolescents with Cystic fibrosis. Indian Pediatr. 2017; 54:545-9.
2. Marshall WA, Tanner JM. Variations in the pattern of pubertal change in boys. Arch Dis Child. 1970;45:13-23.
3. Katzman DK, Bachrach LK, Carter DR, Marcus R. Clinical and anthropometric correlates of bone mineral acquisition in healthy adolescents girls. J Clin Endocrinol Metab. 1991;73:1332-9.
4. Glûer CC, Blake G, Lu Y, Blunt BA, Jergas M, Genant HK. Accurate assessment of precision errors: How to measure the reproducibility of bone densitometry techniques. Osteoporos Int. 1995;5:262-70.

Creating Health Consciousness Among Adolescent Students – An Innovative Initiative

Awareness is the key to prevention of many non-communicable diseases such as coronary artery disease (CAD), diabetes and hypertension. The established methods for creating such awareness are : organizing public awareness campaigns, launching health camps on 'Health Days' such as World No Tobacco Day (31st May), World Health Day (7th April) World Heart Day (29th September), World Diabetes Day (14th November), World Hypertension Day (17th May) and World Cancer Day (4th February). We propose herewith an innovative method of creating health consciousness by imparting health-related lectures to adolescent school students of Grade VIII to X. These lectures pertain to key issues like healthy life style, personal hygiene, heart attack, diabetes, obesity and nutrition, menstrual hygiene, and basic life support. The reason behind this strategy is the belief that the seeds for most lifestyle disorders are laid in early childhood and adolescence. Students are very impressionable, malleable, adoptive and quick learners at this age, and sensitization at an early age shall help inculcate right habits. Further, these children shall be the ambassador of healthy life style to their family and society in future. It is also surmised that they would be able to recognize these diseases at very early stage and persuade the afflicted family members/other persons to seek medical attention urgently.

Guided by the above conviction, we organized multiple lectures in different schools of Delhi. Topics covered were: healthy life style, heart attack, diabetes, personal hygiene and menstrual hygiene. Each lecture was of 40 minutes duration followed by 20 minute interaction. These were PowerPoint-based presentations, and the major thrust was on illustrations. At the end of the lecture session, each school was provided with two copies of NHI School Health Book, specially prepared for such program [1]. We have since taken this program to Almora District in Uttarakhand where we have targeted, besides adolescent students, their parents during parent-teacher meetings.

One of the 15-year-old Grade X student, who had height of 170 cm, and weight of 80 kg (BMI 27.67), became conscious of being overweight after listening to our lecture, and adopted a healthy lifestyle and healthy food habits. Most recent example is that of a 14-year-old American student who recognized early signs of stroke in her mother and informed health authorities; and her mom could be saved from aftermath of paralytic stroke. She could do this because she had heard about stroke in a science lecture only 2 days before her mother had stroke. Such could be the effect of health lectures delivered to adolescent students [2].

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REFERENCES

1. Dwivedi S, Arora YK, Bose PP. NHI School Health Book. Published by National Heart Institute, 2017.
2. Nehma Z, Andrew E, Bernard S, Patsamanis H, Cameron P, Bray JE, *et al*. Impact of public awareness campaign on out-of-hospital cardiac arrest incidence and mortality rates. Eur Heart J. 2017;38:1666-73.