Research Article

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Comprehensive study of health problems in school children of Hyderabad, India

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ABSTRACT

Background: It is estimated that over one-fifth of our population comprises of children aged 5-14 years and only 80% of these children are enrolled in schools. A child spends most of the time in school and it is considered an ideal place for learning and growing up of a child. In India due to poverty and prevailing socio-cultural milieu a substantial number of school children suffer from various diseases which can be prevented if diagnosed and treated early. We conducted this study to evaluate the health and the nutritional status of school children and comparison was drawn between the rural and urban school children.

Methods: This is a cross sectional prospective study where a total of 500 school children from rural and urban government schools were thoroughly assessed by a detailed clinical examination including anthropometry.

Results: It was observed that more than half of the children from both rural (56%) and urban (58%) schools were under nourished. The BCG vaccination coverage was better in urban school children (86.5%), with an overall coverage of 80%. Various other problems were more prevalent in rural school children except respiratory diseases which were observed to be more prevalent in urban school children (7.2%).

Conclusions: It was learnt that the morbidity of school age children from the community's perspective is entirely different from morbidity from health care professional's perspective. Therefore, educating the community will go a long way in improving the quality of life.

Keywords: School age children, Morbidity, Undernourished

INTRODUCTION

Children of today are citizens of tomorrow. As Nehru rightly said "If we do not look after children today, we will be creating more problems for ourselves in future". The health of children and youth is of fundamental value. Health services for school children are a must for building a healthy young India. 1,2 Over one fifth of our population comprise of children aged 5-14 years and only about 80% of these children are enrolled in schools, of

those enrolled 65-80% regularly attend school and are easy to reach. 3

In a developing country like India due to poverty and prevailing socio-cultural milieu a substantial number of school children from pediatric age to adolescents suffer from various diseases. It is estimated that every third child has some sign if ill health manifesting in the form of dental, visual and hearing problems, nutritional deficiencies, respiratory infections, skin disorders, locomotor disabilities etc. The school going age is a formative

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period, physically as well as mentally, transforming the child into a promising adult. Poor health and nutritional status will affect work capacity as well as cognitive functions. With this background, the study was conducted to evaluate the nutritional and health status of school children by physical examination and anthropometric measurements, comparing the pattern of morbidity in rural and urban school children.

METHODS

A cross-sectional prospective study was designed to conduct a detailed physical health assessment of children during the year 2009-2010, by visiting government schools in and around Hyderabad, India. Schools more than 40 Km away from Hyderabad were taken as rural schools and within the city were considered as urban schools. A total of 500 School children were examined. The objectives of the study were explained and informed consent was obtained from the village leader, parents, teachers and children. Age was taken as per school records. A detailed clinical examination from head to toe was done for every child. BCG vaccination status was evaluated by looking for BCG scar on the left upper arm. Information regarding other vaccination was not forthcoming as history and records could not be traced.

Visual activity was tested by using Snellen's charts and near vision charts. Hearing was assessed by Rinnie's test using a tuning fork of frequency 256 Hz. Weight was recorded by a weighing machine to the nearest 0.5 kg and for height, one of the classrooms was calibrated using a metallic tape, they were checked by the same person and the scales were calibrated after each measurement. Comparison was made with Indian Council of Medical Research Data. The standard Indian Academy of Pediatrics classification of protein energy malnutrition could not be followed as most of the Indian low and middle income group children were not standardized. Worm infestation was diagnosed on the basis of history given by the children. Anemia was diagnosed by the presence of pallor in the tongue, nail beds and conjunctiva. Vitamin A deficiency was diagnosed in the presence of xerosis and Bitot's spots as per the criteria laid down by the World health organisation for field survey. Audiometry and laboratory investigations were not done owing to practical difficulties. Data thus generated was entered into the Microsoft Excel Sheet, analyzed for evaluation of the pattern of morbidity in the school children. Results were expressed as range and percentage and were described using descriptive statistics.

RESULTS

Of the total 500 school children, 250 children belonged to the rural schools and 250 to the urban schools. The ratio of boys to girls was very high in rural schools compared to urban schools (Table 1).

Table 1: Depicting boys and girls in urban and rural schools.

Urban		Rural	
Boys	Girls	Boys	Girls
138 (55.2%)	112 (44.8%)	152(60.8%)	98(39.2%)

The incidence of underweight (less than 75th centile) in urban school children was 56.25% whereas it was 58.7% in rural school children. The incidence of underweight (less than 50% centile) in urban school children was 33.75% whereas it was 35.87% in rural school children. The incidence of short stature (less than 5th centile) in urban school children was 8.75% as compared to 5.43% in rural school children (Table 2).

Table 2: Depicting incidence of underweight and height in rural and urban school children.

	Boys		Girls	
Weight	Urban	Rural	Urban	Rural
<75 th	23	25	22	29
centile	(56.09%)	(56.8%)	(56.41%)	(60.42%)
<50 th	13	14	14	19
centile	(31.7%)	(32%)	(35.89%)	(39.58%)
Height				
<5 th	4	2	3	3
centile	(9.7%)	(4.54%)	(7.69%)	(6.25%)

When all the deficiencies were considered together, the magnitude was found to be high with 58.7% of the rural school children and 56.25% of urban school children being affected. Vitamin-A deficiency manifested mostly as Bitots spots and conjunctival xerosis. It was found in 11.2% of rural school children and 5.2% of urban school children. B-complex deficiency was seen in 17.6% of rural school children and 14% of urban school children. Anemia was found to be more common in girls than boys of all age groups in both rural and urban schools (Table 3).

Table 3: Depicting incidence of anemia, b-complex and vitamin a deficiencies among rural and urban school children.

	Rural	Urban
Anemia	110 (44%)	75 (30%)
B-complex deficiency	44 (17.6%)	35 (14%)
Vitamin-A deficiency	27 (11.2%)	13 (5.2%)

BCG vaccination status was evaluated by looking for the scar on left upper arm. Significant improvement and coverage in rural areas is well reflected in our study, rural area coverage being nearly 75%, very close to the urban area coverage (Table 4).

All the other diseases and conditions observed in this study are found to be more prevalent in the rural school children compared to the urban school children, except respiratory diseases like bronchial asthma and upper respiratory tract infections were observed to more common in urban school children (Table 5).

Table 4: Depicting BCG status in urban and rural school children.

	Urban	Rural	Total
Boys	108 (88%)	96 (78%)	204
Girls	108 (85%)	91 (72%)	199

Table 5: Spectrum of diseases in urban versus rural school children.

	Urban	Rural
Dental problems	36.4%	39.2%
Gastro-intestinal diseases	11.2%	12.8%
Respiratory disorders	7.2%	5.2%
Skin diseases	36%	46%
ENT problems	18%	26%
Eye problems	6%	7.2%
CNS disorders	0.4%	0.45%
Musculo skeletal disorders	0.4%	0.39%

DISCUSSION

The incidence of under nutrition was found to be 56.25 % in our study, whereas in a study done by K. Indira Bai et al, it was found to be 47% and 50% in a study done by Dhingra et al. ^{13,12}

It was observed that despite implementation of the midday meal program the intake of the most of the essential nutrients by school children was less than the RDA, perhaps due to the low socio-economic status of the population and consequent inability to afford adequate food. Studies have shown the average Indian diet to be deficient in Iron and Riboflavin.^{4,5} A deficient nutrient intake and substandard growth in children hailing from socio-economically backward families have been observed by other investigators.^{6,7,8}

The incidence of anemia was 37% in our study whereas it was found to be 43% in a study by K. Indira bai et_al and 25.25 % in a study done by Gangadharan et al. 12,9 Other investigators have also observed a high prevalence of Vitamin-A deficiency in school age children in India. 10,11 Parasitic infections such as hookworm and plasmodium species may have contributed to anemia in addition to dietary deficiencies. The incidence of BCG vaccination scar status was found to be 86.45% in urban school children and 74.8% in rural school children, compared to the incidence of BCG vaccination scar status, which was found to be 62% in urban schools and 52% in rural schools in a study done by Indira bai et al. 12

Worm infestation was found to be 12.8% in rural school children and 11.2% in urban school children compared to

20% in Dhingra et al study. 13 Incidence of worm infestation in rural school children was found to be 60% in a study by Gangadharan et al and 27% in a study by Indira Bai et al. 9,12

Dental problems like fluorosis, dental caries and bad oral hygiene were found to be very common in school children with an incidence of 36.4% and 39.2% in urban and rural schools respectively. Study by Dhar V. reported higher prevalence of caries (46.75%) among children in rural areas of Udaipur District, India. ¹⁴ Apart from dental problems, skin disorders were also found to be common among school children affecting almost 36% of urban school children and 46% of rural school children. The common skin manifestations observed in our study were pyogenic skin infections, scabies, pyoderma and fungal infections. Fungal infections were detected in 4.8% of urban school children and in 7.2% of rural school children. In Joseph et al study, 2.38% of rural school children had fungal infection. ¹⁵

Respiratory disorders were found to affect 7.2% of urban school children and 5.2% of rural school children, the main cause being attributed to environmental pollution in cities and urban areas. Eye problems like defective visual acuity, was found to be 6% in urban school children and 7.2 % in rural school children. However, defective visual acuity was found to be 12% among rural school children in Nagaraja et al study, 2.4% in Patwari et al study and 2.23% in a study by K. Indira Bai etal. 16,4,12 Study by Padhye AS reported myopia to be 3.16% in urban school children and 1.45% in rural school children. ¹⁷ Gupta et al at Shimla, India identified refractive error as the commonest morbidity among children (22%) in their study. 18 Mukerjee et al stated the importance of early detection and treatment of refractive errors to prevent permanent disability.19

Ear, nose and throat disorders manifestating as chronic tonsillitis and chronic otitis media were more among the rural school children with an incidence of 26% as compared to 18% in urban school children. Chronic tonsillitis was found in 8.8 % of rural school children whereas in 8% or urban school children. In a study carried out by Banik D et al, it was observed 19.3% of rural school children were affected with chronic tonsillitis.²⁰

Central nervous system disorders were rare in school children although an epileptic child was found in rural school.

Musculoskeletal disorders were not many, 1 child in urban school had residual poliomyelitis. Old stigmata of rickets were found in few children and bow legs were found in 1 child from a rural school.

Very few cardiovascular diseases were found, rheumatic heart disease being common was found in three urban school children and two rural school children. Two children previously diagnosed with congenital heart disease were found in rural schools.

The health supervision of school children is necessary as it can help identity the magnitude of morbidity and malnourishment in a community. As these health problems make learning difficult and may seriously hamper the education and child's intellectual growth. Moreover, this can also lead to low school enrollment, early drop out, high absenteeism and poor scholastic performance.

It has been observed from the study that the nutrition and health standards of government school children are still far inferior to the ICMR standards and warrants large scale multicentric studies to identify the limitations and lacunae of the current implemented programs. Health education measures should be included through different programs to improve the personal hygiene, poor sanitary practices and to provide nutritional supplements like iron and vitamin-A and periodic de-worming in schools.

CONCLUSION

In conclusion, this study has shown that whatever the community understands as morbidity among school age children is different from the morbidity observed in them on clinical examination. The community is also unaware of the etiology of these conditions. Therefore educating the community about these conditions and their impact in the health of school age children, their etiology and prevention will go a long way in improving the quality of life of these children.

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