Prevalence of anaemia and undernutrition among street children in Mysuru, India

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Abstract

Objectives: To assess the haemoglobin levels and nutritional status of the street children in Mysuru.

Method: In this prospective study, 204 street children were recruited. Clinical examination was done and haemoglobin was estimated with the cyanmethaemoglobin method. Classification of anaemia and undernutrition was done according to WHO criteria.

Results: Anaemia was noted in 52.5% children and 62.6% of these anaemic children had moderate anaemia. Prevalence of underweight, stunting and wasting was 76.5%, 36.8% and 52% respectively.

Conclusion: Of the street children in Mysuru, 52.5% had anaemia, 76.5% were underweight, 36.8% had stunting and 52% had wasting according to WHO criteria.

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(Key Words: Street children, undernutrition, anaemia)

Introduction

Children must be cared, nurtured and educated properly to promote the progress of the nation. Some of the unfortunate children lack parental upbringing and support and grow in street as street children. Often they meet with a harsh physical and psychological environment making them vulnerable for many health infirmities[1,2].

Unfortunately, problems of street children are growing at an alarming speed throughout the world[3,4]. It is very difficult to estimate the exact number of street children throughout the world, but the number is likely to be as high as 100 million[4,5,6]. India accounts for 10% of the world street children[5]. In India, around 63% of children go to bed hungry and 53% suffer from chronic malnutrition, which reflects the poor status of children in general[1]. Little is known about the health and nutritional status of street children. Anaemia is the common treatable problem which can lead to intellectual and cognitive dysfunctions in children[7]. Most of the studies reported anaemia on clinical grounds not on estimation of haemoglobin levels[4,8,9].

Objective

The main objective of this study was to estimate the haemoglobin levels and to asses nutrition of street children in Mysore city.

Method

This prospective, cross sectional descriptive study was conducted in the city of Mysuru, Karnataka State, India. For this study a convenient sample size of 204 street children were enrolled. Ethical approval was obtained from Jagadguru Sri Shivarathreeshwara Medical College, Mysuru Ethical Committee. Consent was obtained from the District Block Education Officer, Sarva Shikshana Abhiyana Programme and Officer in Charge for Street Children, Non-Governmental Organisation (NGO), Mysuru. Information about the age of the child was collected from the caretakers of the children (NGO/guardians/parents). Informed consent was also obtained from the individual subjects. A detailed clinical examination was followed by anthropometric measurement. Weight was measured with a portable scale and height was measured using a stadiometer in standing position. All the observations were recorded in a predesigned case report form. Classification of various degrees of anaemia and undernutrition was done according to World Health Organization (WHO) criteria[10,11]. Prevalence of malnutrition (underweight, stunting and wasting,) by age and sex classification was based on WHO reference curves. The height and weight of each child was

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compared with the WHO child growth standards for that particular age and sex to get weight for age, height for age and weight for height indices. Children below two standard deviations (2SD) of the reference median on any of these indices were considered as malnourished and termed as underweight, stunted and wasted respectively. Haemoglobin was estimated by the cyanhaemoglobin method.

All data obtained were entered in MS excel sheet, analysed and interpreted in terms of mean, SD and percentages as appropriate. SPSS version 22 was used for further analysis like Chi-square test / Z-test for difference between proportions. The association and differences were interpreted to be statistically significant at $p<0.05$.

Results

Of 204 children, 158 (77.5%) were males. There were 178 (87.2%) children in the age group of 7-16 years. Prevalence of underweight, stunting and wasting according to age and sex among the street children is shown in Table 1.

Table 1: ***Prevalence of underweight, stunting and wasting according to age and sex among street children***

Category	Number of children (%)	Undernutrition		Wasting		Stunting	
		Present	Absent	Present	Absent	Present	Absent
Age (Years)							
Less than 7	26 (13.0)	18 (69.2%)	08 (30.8%)	09 (34.6%)	17 (65.4%)	12 (46.2%)	14 (53.8%)
7-10	83 (40.5)	63 (75.9%)	20 (24.1%)	40 (48.2%)	43 (51.8%)	20 (24.1%)	63 (75.9%)
11-16	95 (46.5)	75 (78.9%)	20 (21.1%)	57 (60.0%)	38 (40.0%)	43 (45.3%)	52 (54.7%)
Total	204	156 (76.5%)	48 (23.5%)	106 (52.0%)	98 (48.0%)	75 (36.8%)	129 (63.2%)
'P' value	-	0.578		0.048		0.008	
Sex							
Male	158 (77.5)	124 (78.5%)	34 (21.5%)	88 (55.7%)	70 (44.3%)	56 (35.4%)	102 (64.6%)
Female	46 (22.5)	32 (69.6%)	14 (30.4%)	18 (39.1%)	28 (60.9%)	19 (41.3%)	27 (58.7%)
'P' value	-	0.146		0.035		0.289	

The overall prevalence of underweight, wasting and stunting in street children is 76.5%, 52% and 36.8% respectively (Table 1). Higher prevalence of underweight was seen among boys when compared to girls but this was not statistically significant (p=0.14). Prevalence of wasting was significantly higher in boys (p=0.03).There was no significant difference in the prevalence of stunting between genders (p=0.28) (Table 1).

The WHO classification of anaemia was used[11]. This is as follows:

- *Children 5-11 years of age*: mild = 11.0-11.4g/dl; moderate = 8.0-10.9g/dl; severe = below 8.0g/dl.
- *Children 12-14 years of age*: mild = 11.0-11.9g/dl; moderate = 8.0-10.9g/dl; severe = below 8.0g/dl.
- *Females >15 years*: mild = 11.0-11.9g/dl; moderate = 8.0-10.9g/dl; severe = below 8.0g/dl.
- *Males > 15 years*: 11.0-12.9g/dl; moderate = 8.0-10.9g/dl; severe = below 8.0g/dl.

Prevalence and severity of anaemia among street children according to the WHO classification is shown in Table 2.

Table 2: ***Prevalence and severity of anaemia among street children according to the WHO classification*[11].**

Age (years)	No.	Anaemia +	Male	Female	Mild	Moderate	Severe
05	04	01	01	00	00	01	00
06	22	11	05	06	03	07	01
07	17	06	04	02	02	04	00
08	22	08	07	01	04	04	00
09	16	10	09	01	03	07	00
10	28	11	08	03	03	08	00
11	19	12	10	02	06	06	00
12	31	23	18	05	09	14	00
13	23	13	12	01	04	08	01
14	17	10	08	02	04	06	00
15	04	02	01	01	00	02	00
16	01	00	00	00	00	00	00
Total	204	107 (52.5%)	83 (52.5%)	24 (52.2%)	38 (35.5%)	67 (62.6%)	02 (01.9%)

All of them were Hindus. Overall 52.4% of street children were anaemic and this was seen nearly equally in both genders (males = 52.5%, females = 52.2%). Majority of anaemic children were in the moderate group (62.6%) according to WHO classification (Table 2).

Discussion

Street environment poses lots of risks and hazards leading to numerous health problems. About 72% of street children belong to 6–12 years of age group and 13% children were aged below 6 years according to UNICEF[12]. It is uncommon to find children below 5 years as street children[3]. The age of the street children in our study ranged from 5 to 16 years and 87% of them belong to the age group of 7-16 years. Several studies have shown that the majority of the street children are boys[3,4,6,8,12]. In our study, 77.5% of street children were boys. This could be attributed to increased emotional gap and conflict between parents and children at the time of puberty[13]. In contrast, girls work as domestic servants in houses as street life is more dangerous because they are vulnerable to sexual abuse[3,4] .

Most of the studies reported anaemia on clinical grounds not on estimation of haemoglobin levels[4,8,9]. Various studies reported anaemia in more than 70% of street children[3,8,9,14,15]. Study conducted in Beni-Suief city revealed anaemia in 86.1% of street children, who also had high prevalence of parasitic infestation which they attributed to the very high prevalence of anaemia[3]. Among street children in Ghana, anaemia was detected in 78% and 92% of them had parasitic infestations[14].The studies from Alexandria and Cairo also observed anaemia in 78% and 73% of street children respectively[9,15]. In our study, prevalence of anaemia is comparatively less than the above studies. However, a study from Nepal revealed 6.2% of street children were anaemic[4]. Almost 47.9% children in this study consumed meat multiple times a week and this may be the reason for the low prevalence of anaemia[4]. In another study from Indonesia, the prevalence of anaemia was only 29.3% of street children and it was more common in females (45.3%) compared to males (23.4%) unlike in our study group[16]. Probably the difference in the prevalence of anaemia among various studies can be due to subjective difference in clinical assessment of pallor, to the parasitic infestations and the quality of the diet consumed.

Malnutrition is highly prevalent in developing and underdeveloped countries. In India, the undernutrition is noticed up to the tune of 50% in the adolescent age group[17]. Our study reflected the same with accentuated proportion of malnutrition in street children. This increase prevalence of malnutrition may be because of lack of good nutritious diet which is necessary for the young adolescents for their normal growth. Most of the street children around the world are malnourished and underweight[5,6]. Study from Kenya reported stunting in 31.1% and underweight in 41.9% of street children[18]. Kiwanis magazine, reported it as high as 83% in Ghana[14]. Rita Patrias et al from Indonesia have reported that 42.7% and 80.4% of street children were underweight and stunted respectively[16]. Irregular earnings, irregular availability of food and spending on health issues predispose these street children to undernutrition[3,4]. This is generally compounded by unhealthy lifestyles and bad habits such as smoking cigarettes, addiction to glue, or liquor etc[16]. A limitation of the study is that the age of the child was obtained from NGOs in some instances and this may not be very reliable.

Conclusions

Of the street children in Mysuru, 52.5% had anaemia, 76.5% were underweight, 36.8% had stunting and 52% had wasting according to WHO criteria.

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