Prevalence of Anaemia and its associated factors among children in suburban Puducherry - A cross sectional study

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Abstract

Introduction: Nutritional anemia is a recognized public health problem with a higher prevalence in developing countries. Anaemia is a silent emergency and nearly 70% of children and 55% of middle aged women are affected in India.
Objective: The study was aimed to estimate the prevalence of anaemia and its associated factors among children.
Methodology: The study was done in suburban Puducherry. All consecutive new patients with consenting parents below the age of 14 years were included in the study. Data was collected on demographic profile, mother's profile, hygiene, dietary intake, anthropometric measurements and hemoglobin estimated by portable hemoglobinometer.
Results: The prevalence of anaemia was 54.25% and was significantly associated with rural residence, lower economic status, schooling, maternal Hb level & education, overcrowding, open defecation, hand washing, deworming, walking barefoot, birth weight, breast feeding and nutritional status, whereas the prevalence was not significantly associated with age, gender and religion.
Conclusion: The prevalence of anaemia was high and level of hygiene and sanitation was low which emphasized the need of intensive health education to bring behavioral change among the participants.

Keywords: Anaemia, Prevalence, Hygiene, Sanitation, Demography.

Introduction

Nutritional anemia is when hemoglobin content of blood is lower than normal as a result of deficiency of one or more essential nutrients.[1] Nutritional anemia is a recognized public health problem with a higher prevalence in developing countries. Globally anaemia affects 1.62 billion people which correspond to 24.8% of the population. The highest prevalence is in preschool age children (47.4%) and the lowest prevalence in men (12.7%).[2] Anaemia is a major health problem in India. According to the National Health and Family Survey (NFHS-3), the prevalence of anaemia was 70% in children aged 6-59 months, 55% in females aged 15-49 years and 24% in males aged 15-49 years. Anaemia is silent emergency and has a staggering effect on health and economy of low and middle income countries. Anaemia during pregnancy is associated with increased maternal mortality, preterm labor, low birth weight and infant mortality. In children it affects the cognitive and motor development and impairs immunity and increase the predisposition to infections,[3] whereas it leads to substantial physical productivity losses in adults.[4] As there is paucity of epidemiological data of anaemia in suburban setting, this study aims to estimate the prevalence of anaemia among children in suburban Puducherry.

Materials & Methods

The sample size was calculated by using the formula (1.96 X p X (1-q)}/ (0.05).[2] Considering the prevalence of anaemia as 52.88% and 95% confidence, the target sample size was 383.[5] All consecutive new patients with consenting parents below the age of 14 years were included in the study. Data was collected by questionnaires filled by parents. Data was collected on demographic profile [gender, age, ethnicity, religion, residence, social class and school]; Mothers profile [Hemoglobin status and schooling]; hygiene [overcrowding, using toilets, soap washing after defecation, walking bare foot and deworming]; dietary intake [history of breast feeding and thrice weekly intake of iron rich foods]; anthropometric measurements [birth weight and BMI] and hemoglobin measurement in the peripheral blood was obtained by finger prick and reading were made in a portable hemoglobinometer. According to WHO anaemia was diagnosed when Hemoglobin was <11 g/dl for children <6 years and <12 g/dl for ≥ 6 to 14 years old children. Data was entered in Microsoft Excel 2013 and analyzed by SPSS version 16.

Results

A total of 400 participants were included in the study. Mean age of the participants was 7.1years and 51.25% were females. 88% were Hindu and remaining 6.75% and 5.25% were Muslims and Christians respectively. 71% of the participants were from urban area and 15.75% belonged to Below Poverty Line category (BPL). 36.5% attended public school and the remaining 63.5% attended private school. 80.3% of the participant mothers were literate and 55.5% were found to be anaemic. 52% of the participants lived in overcrowded house, 34.5% practiced open defecation, 47% did not wash hand after defecation, 14.5% walked bare foot and 17% were dewormed within past 6

months.28.25% of the participants weighed less than 2.5% at birth, 72.25% were exclusively breast fed, 30.75% have iron rich diet atleast thrice a week and 39.25% were found to be stunted. The prevalence of anaemia was 54.25% (Table 1) (Fig. 1).

The prevalence of anaemia was significantly more common in those residing in rural area [68.1%], those living below poverty line [82.3%] and those who attended public school [62.3%]. Anaemia was significantly more common in participants whose mothers were anaemic [63.5%] and less educated [65.6%]. Anaemia was significantly more common among participants who resided in overcrowded house [63%], practiced open defecation [71.1%], who did not wash hand with soap after defecation [68.6%], walked bare foot [70.6%] and not recently dewormed [59.3%]. Participants who weighed less than 2.5 kg at birth [60.1%], not breast fed [64.8%], stunted [61.8%] and who did not have iron rich diet [63.2%] were significantly associated with anaemia (Table 2), whereas the prevalence was not significantly associated with age, gender and religion.

Table 1: Prevalence of anaemia

Anaemia	Frequency	Percentage
Present	217	54.25
Absent	183	45.75
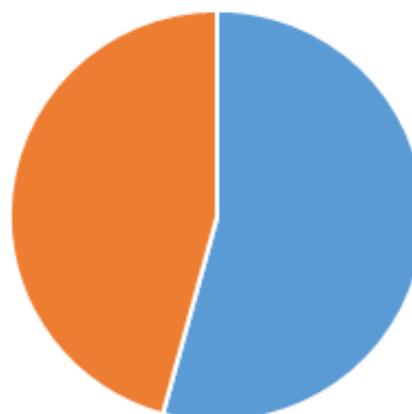
■ ANEMIC   ■ NOT ANEMIC

Fig. 1: Prevalence of anaemia

Table 2: Distribution of anaemia in relation to the following variables

Variable	Anaemia present	Anaemia absent	Total	Chi – square value	Df	P value
Age group						
< 6 months to 6 years	100	72	172			
6 years to 14 years	117	111	228	0.049	1	>0.05
Total	217	183	400			
Gender						
Male	97	98	195			
Female	120	85	205	0.0095	1	>0.05
Total	217	183	400			
Religion						
Hindu	194	158	352			Bonferroni
Muslims	12	15	27	5.30	2	correction
Christians	11	10	21			>0.0167
Total	217	183	400			
Residence						
Urban	138	146	284			
Rural	79	37	116	12.63	1	<0.005
Total	217	183	400			
Economic status						
BPL	51	12	63			
Above poverty line	166	181	337	24.66	1	<0.005
Total	217	193	400			
Schooling						
Public School	91	55	146			
Private School	126	128	254	82.6	1	<0.001
Total	217	183	400			
Mother Hb level						
>12	76	102	178			
<12	141	81	222	73.7	1	<0.001
Total	217	183	400			
Mothers schooling						
Illiterate	42	27	79			

Primary	79	26	105	41.7	5	Bonferroni correction <0.008
High	67	50	117			
Secondary	15	24	39			
Graduate	11	35	46			
Post-graduate	3	11	14			
Total	217	183	400			
Over crowding						
Present	131	77	208			
Absent	86	106	192	20.6	1	
Total	217	183	400			<0.005
Toilet						
Present	119	143	262			
Absent	98	40	138	49.8	1	
Total	217	183	400			<0.005
Hand washing with soap	88	124	212			
Present	129	59	188	71.6	1	
Absent	217	183	400			<0.001
Total						
Walking bare foot	41	17	58			
Present	176	166	342	42.84	1	
Absent	217	183	400			<0.005
Total						
Deworming	20	48	68			
Present	197	135	332	134.1	1	
Absent	217	183	400			<0.0005
Total						
Breast fed	145	154	289			
Present	72	29	111	64.8	1	
Absent	217	183	400			<0.001
Total						
Intake of iron rich foods	42	81	123			
Present	175	102	277	110.7	1	
Absent	217	183	400			<0.0005
Total	68	45	113			
Birth weight	149	138	287	46.1	1	
< 2.5 kg	217	183	400			<0.005
>2.5 kg						
Total	97	60	157			
Stunted	120	123	243	61.8	1	
Present	217	183	400			<0.001
Absent						
Total						

Discussion

In this study the prevalence of anaemia among children was 54.25% which was similar to a study conducted in Punjab[6] and Tamil Nadu. The prevalence was not significantly associated with age and gender which was consistent with WHO study[7] and contradictory to Tiwari K et al and Gerardo Alvarez Uria et al study.[8,9] Higher prevalence of anaemia was found in participants who belonged to BPL [82.3%], whose mothers were anaemic [63.5%] and less educated [65.8%] which was on par with the findings of Pushpa O Lokare et al[10] and Sant-Ryan et al study.[11] The prevalence of anaemia was higher in overcrowded household [63%] which may be attributed to more frequent infections and it corroborates with Serbia study.[12] Participants with poor hygienic practice i.e. open defecation [71.1%], who did not wash hands with soap after defecation [68.6%], walked bare foot [70.6%] had higher prevalence of anaemia which may be due to more hook worm infestation among them. The findings were similar to the findings of Orraya Porniammongkol study.[13] Anaemia was more common in participants who weighed less than 2.5 kg at birth [60.1%], not breast fed [64.8%], stunted [61.8%] and who did not have iron rich diet regularly [63.2%] and these findings were on par with the Marco Antonio A and Tatala S studies.[14,15]

The study throws light on the prevalence of anaemia and the associated factors in suburban Puducherry. The results were surprising even though the participants were from suburban Puducherry, a relatively developed state, the prevalence of anaemia was high and the level of hygiene and sanitation was low. The finding emphasized on the need for continuous and intensive health education regarding the use of sanitary latrine, regular deworming and correct dietary practices.

Conclusion

Inspite of the health care facilities available in the vicinity, the prevalence of anaemia was high and the level of hygiene and sanitation was low among the participants. It shows the need for sensitizing and educating the people regarding the need of sanitary latrine, proper personal hygiene, the importance of deworming and to follow correct dietary practices.

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