



Research Article

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A STUDY ON DEMOGRAPHIC STATUS OF MORBIDITY PATTERN IN CHILDREN UNDER 5 YEARS

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ABSTRACT

Children are more susceptible to infections due to less immunity power. Frequent illnesses among children influence adversely on their growth and development. So the health status of this vulnerable age group (under 5 years age) is very much important as morbidities affect their health which influences the overall health status of the country. More than half of the children (53.7%) are suffering from some form of illness. Recurrent respiratory infection, recurrent diarrhea, recurrent fever, etc. are the most common causes of morbidity in immune-compromised children. The present study was planned to provide the demographic status of the morbidity pattern in children less than 5 years in a defined population. A cross sectional study was conducted from July 2018 to February 2019 by attending and participating in various health camps in various villages in periphery of Jaipur organized by PG Department of Kaumarabhritya, NIA, Jaipur. The sample size was calculated 501 (n = 501). All children from 06 months to 5 years were included in the study. During the study period, the sample size was 501, in which 187 (37.33%) children were found with morbidity features of either sex. Mainly 161 (32.14%) subjects were infected with recurrent RTIs, 98 (19.56%) subjects with anemia, 63 (12.57%) subjects with recurrent fever, 26 (5.19%) subjects with recurrent diarrhea and 17 (3.39%) subjects with skin infections. For enhancing the immunity of children and awareness about health, many Swarnaprashana camps and health checkup camps in various preschools situated in Jaipur were organized by PG Department of Kaumarabhritya, NIA and Jaipur.

Keywords: Children morbidity, Recurrent RTIs, Recurrent Diarrhea and Recurrent Fever, Anemia, Skin Infections, Dental Caries, Mottled Enamel, Hair Changes, Swarnaprashana.

INTRODUCTION

Children are more susceptible to infections due to less immunity power. Frequent illnesses among children influence adversely on their growth and development. The immune system continues to develop as the infant grows. So the health status of this vulnerable age group (under-five children) is very much important as morbidities affect their health which influences the overall health status of the country. In India, common morbidities among children are mainly fever, acute respiratory infections, diarrhea and malnutrition. If hygienic nutrition is given then it boosts up the immunity and children are prevented from fever, acute respiratory infections, and diarrhea. In appropriately malnutrition is rarely perceived as a morbid event by families, communities, and the health systems.^{1,2} Infectious diseases like diarrhea, acute respiratory infections, malaria, and whooping cough have been found to be the main cause of morbidity and premature death especially in children in developing countries. 6.9% of deaths in children were attributed to respiratory infections, 2.2% to malarial fever, and 2.0% to childhood diseases.³ In the first 2 years of life, 80% of these deaths occur because of dehydration, a complication associated with dysentery, malnutrition and serious infection such as pneumonia.

Therefore, an attempt has been made in this demographic study to look for the morbidity pattern in children under 5 years. Hence for enhancing the immunity of children, Swarnaprashana camps and health checkup camps were organized by PG Department of Kaumarabhritya, NIA, and Jaipur.

During this demographic study, different types of morbidities are found in children under 5 year's age. Swarnaprashana camps are organized by PG Department of Kaumarabhritya, NIA and Jaipur. Every Ayurveda medicines have the advantage of diversity, easy accessibility, flexibility, and broad continuing acceptance in developing countries and increasing popularity in developed countries.^{4,6} Low levels of technological input, relatively fewer side effects and growing economic importance are some of the other features favoring Ayurveda medicine.^{5,6}

Aims and objectives of study

The present study was planned to conduct with main objectives i.e. to study the demographic status of morbidity pattern in children under 5 years in a defined population.

MATERIAL AND METHODS

A cross-sectional study was conducted from July 2018 to February 2019 by attending and participating various health camps in various villages in the periphery of Jaipur viz, Jamwa Ramgarh subdivision (Sayapura and Chainpura) and Swarnaprashana camps and health checkup camps in various preschools situated in Jaipur namely Shivam Public school, Jaipur children academy, Maharashtra Mandal of Jaipur district and various Anganwadi centers of Brahmpuri and Jaisinghpura Khor sectors organized by PG Department of Kaumarabhritya, NIA, Jaipur. The population of the area was approximately 15000 considering P = 0.7, a 10% error. The sample size was calculated 501 (n = 501). All children from 06 months to 5 years were included in the study.

Children studied were mostly from low and lower-middle socioeconomic status and the majority of them were scheduled tribes. A detailed Performa which included data regarding socioeconomic status, medical history, and consent was given to school children to be completed by parents/guardians. The same was also given to the mothers of children who were less than preschool age. A detailed medical examination including anthropometry was done and recorded on the Performa. Socioeconomic status was estimated according to Kuppuswamy socioeconomic scale. The incidences of morbidity features like running nose, nasal obstruction, enlarged tonsil, dyspnoea, fever, cough, sore throat, and diarrhea in the previous three months were asked by parents and calculated Mean value, Standard deviation of all these morbidity features.

Statistical Analysis

Analysis of the results was done using the statistical method - Chi square test and p value.

Ethical clearance

The study was approved from Institutional Ethics Committee, NIA with No. IEC/ACA/2017/95 on date 26/04/2017.

RESULT

The Performa was applied on a total number of 501 subjects by attending and participating various health camps in various villages in the periphery of Jaipur viz, Jamwa Ramgarh subdivision (Sayapura and Chainpura), and Swarnaprashana camps and health checkup camps in various preschools situated in Jaipur namely Shivam Public school, Jaipur children academy, Maharashtra Mandal of Jaipur district and various Anganwadi centers of Brahmpuri and Jaisinghpura Khor sectors organized by PG Department of Kaumarabhritya, NIA, Jaipur. The brief observations of the study are as under:

It is observed that the maximum of 192 children (38.32%) belonging to age group 4 yrs - 5 yrs but the maximum percentage of subjects 52.27% were found with morbidity features in the age group 06 months – 2 yrs. On statistical analysis relation between age and prevalence of morbidity features were found not significant ($P > 0.05$). 207 (41.32%) patients were female children and the rest were male children. The percentage of morbidity was 39.8% in male children and 33.82% in female children. On statistical analysis relation between sex and prevalence of morbidity features were found Not Significant ($P > 0.05$). 430 (85.83%) subjects were Hindu followed by 59 (11.78%) subjects were Muslim. 05 (0.998%), 04 (0.798%) and 01 (0.599) subjects were Sikh, Jain and Christian religion. On statistical analysis relation between religion and prevalence of morbidities was found Not Significant ($P > 0.05$). 76% were partially immunized as per the above-given schedule (BCG, OPV, DPT, Hepatitis-B, Measles, MMR, Other). Complete and No immunization was found in 24% and 0% subjects respectively. 39.37% subjects of partial immunization status were

found with morbidities. On statistical analysis relation between immunization status and prevalence of morbidities was found Not Significant ($P > 0.05$). Maximum 180 (35.93%) subjects belonged to the lower class, 166 (33.13%) and 80 (15.97%) subjects belonged to the lower-middle and middle-class families respectively. 45 (8.98%) subjects were from upper-middle class and minimum 30 (5.99%) subjects were from upper class. On statistical analysis relation between socioeconomic status and prevalence of morbidities was found Significant ($P < 0.05$). The majority of subjects i.e. 410 (82%) were average by general hygiene. 47 (9%) subjects were found to be poor and 44 (9) subjects were found to be good by general hygiene.

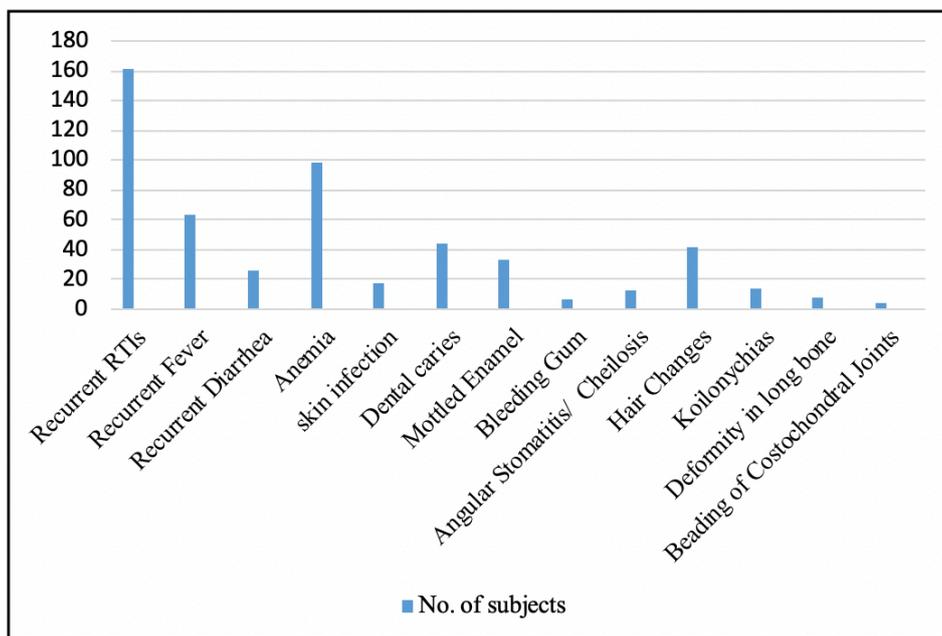
The maximum percentage of subjects with recurrent RTI was 28 (63.64%) in age group 6 months – 2 years followed by 45 (36%) in age group 2 years - 3 years. On statistical analysis relation between age and prevalence of respiratory tract infection was found Significant ($P < 0.05$). The maximum percentage of subjects with recurrent fever was found in the age group 6 months – 2 years i.e. out of 44 subjects, 11 (25%) were obtained followed by out of 192 subjects, 28 (14.58%) were found in age group 4 years – 5 years. After statistical analysis, P value - 0.0484, which showed significant results, was found. Out of 44 subjects age between 6 months-2 years, 08 (18.18%) were found with the recurrent diarrheal episode. Out of 125 subjects, age between 2 years – 3 years, 07 (5.6%) were found with RDE, Out of 140 subjects, age between 3 years – 4 years, 06 (4.3%) were found with RDE and Out of 192 subjects, age between 4 years – 5 years, 5 (2.60%) were found with RDE. After statistical analysis, P value - 0.002, which showed very significant result, was obtained. In the age group 06 months – 2 years, 20 (45.45%) were having clinically pallor, 20 (16%) were in the age between 2 years – 3 years, 28 (20%) were in age between 3 years – 4 years, 30 (15.63%) were in the age between 4 years - 5 years. On statistical analysis, the relation between age and No. of subjects with pallor was found significant ($P < 0.05$). In age group 06 months - 2 years, 01 (2.27%) subject was reported with H/O skin infection, in age group 2 years – 3 years, 03 (2.4%) subjects were reported, in age group 3 years – 4 years 05 (3.57%) were reported and in age group 4 years – 5 years maximum 8 (4.17%) were reported with H/O skin infection. On statistical analysis relation between age and prevalence of skin infections was found Not Significant ($P > 0.05$). Only these four areas of oral disease were taken. Total 96 (19.16%) subjects were suffering from oral diseases out of them, maximum 44 (8.78%) were having dental caries, 33 (6.59%) were suffered from mottled enamel, 07 (1.4%) with bleeding gum and 12 (2.4%) were found with angular stomatitis/cheilosis. Hair change was found in 42 Subjects, 14 Subjects with koilonychia, 08 Subjects with a deformity in long bone and 04 Subjects with beading of costochondral Joints.

Maximum 98 (19.6%) subjects were found anemic, 96 (19.16%) subjects were suffering from oral diseases. Recurrent diarrhea was found in 54 (10.78%) subjects, recurrent respiratory tract infections were found in 161 (32.14%) subjects, and recurrent fever in 63 (12.57%) subjects. In others, 44 (8.78%) subjects were suffered from dental caries.

Table 1: Observation of demographic study

S. No.	Feature	Classification	No. of Subjects		No. of subjects with morbidity features		Total No. of subjects with morbidity features	
			No.	%	No.	%	No.	%
1.	Age	06 months – 2 years	44	8.78	23	52.27	187	37.33
		2 years – 3 years	125	24.95	56	44.8		
		3 years – 4 years	140	27.94	46	32.86		
		4 years – 5 years	192	38.32	62	32.29		
2.	Sex	Female	207	41.32	70	33.82	187	37.33
		Male	294	58.68	117	39.8		
3.	Religion	Hindu	430	85.83	142	33.02	187	37.33
		Muslim	59	11.78	30	50.85		
		Sikh	05	0.998	2	40		
		Jain	04	0.798	2	50		
4.	Socio-economic status	Christian	03	0.599	1	33.33	187	37.33
		Upper	30	5.99	4	13.33		
		Upper Middle	45	8.98	8	17.78		
		Middle	80	15.97	35	43.75		
5.	Immunization status	Lower Middle	166	33.13	68	40.96	187	37.33
		Lower	180	35.93	72	40		
		No immunization	00	00	00	00		
		Complete	120	24	37	30.83		
6.	Recurrent Respiratory tract infections (RTIs)	Partial	381	76	150	39.37	161	32.14
		6 Months – 2 years	44	8.78	28	63.64		
		2 years – 3 years	125	24.95	45	36		
		3 years – 4 years	140	27.94	36	25.71		
7.	Recurrent Fever	4 years – 5 years	192	38.32	52	27.08	63	12.57
		6 Months – 2 years	44	8.78	11	25		
		2 years – 3 years	125	24.95	9	7.2		
		3 years – 4 years	140	27.94	15	10.71		
8.	Recurrent Diarrhea	4 years – 5 years	192	38.32	28	14.58	26	5.19
		6 Months – 2 years	44	8.78	08	18.18		
		2 years – 3 years	125	24.95	07	5.6		
		3 years – 4 years	140	27.94	06	4.3		
9.	Anemia	4 years – 5 years	192	38.32	05	2.60	98	19.56
		6 Months – 2 years	44	8.78	20	45.45		
		2 years – 3 years	125	24.95	20	16		
		3 years – 4 years	140	27.94	28	20		
10.	Incidence of skin infection	4 years – 5 years	192	38.32	30	15.63	17	3.39
		6 Months – 2 years	44	8.78	1	2.27		
		2 years – 3 years	125	24.95	3	2.4		
		3 years – 4 years	140	27.94	5	3.57		
11.	Dental caries	4 years – 5 years	192	38.32	8	4.17	44	8.78
		6 Months – 2 years	44	8.78	04	9.09		
		2 years – 3 years	125	24.95	07	5.6		
		3 years – 4 years	140	27.94	12	8.57		
12.	Mottled Enamel	4 years – 5 years	192	38.32	21	10.94	33	6.59
		6 Months – 2 years	44	8.78	03	6.82		
		2 years – 3 years	125	24.95	05	40		
		3 years – 4 years	140	27.94	08	5.71		
13.	Bleeding Gum	4 years – 5 years	192	38.32	17	8.85	07	1.4
		6 Months – 2 years	44	8.78	00	00		
		2 years – 3 years	125	24.95	01	0.8		
		3 years – 4 years	140	27.94	02	1.43		
14.	Angular Stomatitis/ Cheilosis	4 years – 5 years	192	38.32	04	2.08	12	2.4
		6 Months – 2 years	44	8.78	00	00		
		2 years – 3 years	125	24.95	01	0.8		
		3 years – 4 years	140	27.94	04	2.86		
15.	Hair Changes	4 years – 5 years	192	38.32	07	3.65	42	8.38
		6 Months – 2 years	44	8.78	04	9.09		
		2 years – 3 years	125	24.95	10	8		
		3 years – 4 years	140	27.94	13	9.29		
16.	Koilonychias	4 years – 5 years	192	38.32	15	7.81	14	2.79
		6 Months – 2 years	44	8.78	01	2.27		
		2 years – 3 years	125	24.95	03	2.4		
		3 years – 4 years	140	27.94	06	4.29		
17.	Deformity in long bone	4 years – 5 years	192	38.32	04	2.08	08	1.6
		6 Months – 2 years	44	8.78	00	00		
		2 years – 3 years	125	24.95	00	00		
		3 years – 4 years	140	27.94	03	2.14		

18.	Beading of Costochondral Joints	6 Months – 2 years	44	8.78	00	00	04	0.8
		2 years – 3 years	125	24.95	00	00		
		3 years – 4 years	140	27.94	02	1.43		
		4 years – 5 years	192	38.32	02	1.04		



Graph 1: No. of subjects with morbidity features in defined populations

DISCUSSION

Total of 501 children were included in the demographic study. Out of total 501 children, 44 children (8.78%) were belonging to age group 06 months – 2 years. Maximum percentage of subjects 52.27% were found with morbidity features in age group 06 months-2 years. It was also evidenced that patients with immune deficiency syndromes involving B-lymphocytes, viz X-linked agammaglobulinemia, suffer from recurrent pyogenic infections primarily involving the sinopulmonary tract. These defects usually manifest after 6 months of life when the passively transferred maternal IgG antibodies levels begin to decline. The capacity to produce specific antibodies to protein antigens is intact at the time of birth. However, normal cannot produce antibodies to polysaccharide antigens until usually after two years of life.⁷ 207 (41.32%) patients were female children and 294 (58.68%) patients were male children. The percentage of morbidity was 33.82% in female children and 39.8% in male children. It is also documented that in the age-group under 5 years, male population is more than female in both urban and rural areas of Rajasthan.⁸ It is revealed that serum IgM levels of girls were generally higher and differed significantly from those of the boys.⁹ So males were obtained more than females with morbidity features. 430 (85.83%) subjects were Hindu followed by 59 (11.78%) subjects were Muslim. 05 (0.998%), 04 (0.798%) and 01 (0.599) subjects were Sikh, Jain, and Christian religion. Higher incidence of the Hindu religion may be due to the predominance of the Hindu community in the study area. 76% of subjects were partially immunized as per the above-given schedule (BCG, OPV, DPT, Hepatitis-B, Measles, MMR, Other). Complete and No immunization was found in 24% and 0% subjects respectively. 39.37% of subjects of partial immunization status were found with morbidity. Maximum 180 (35.93%) subjects belonged to lower class, 166 (33.13%) and 80 (15.97%) subjects belonged to lower-middle and middle-class families respectively. This type of distribution was obtained because only

middle- and lower-class family’s approaches to government hospitals for cheaper treatment and they are unaware of the importance of health and nutrition of their child. Socioeconomic status is measured with the help of the Kuppuswamy Scale.

Subjects who were affected by any RTI, > 3 episodes in the last 3 months were considered as subject of this study. Out of 501 subjects, maximum subjects were affected with recurrent RTI in age group 6 months - 2 years. In age group 6 months – 2 years, 28 (63.64%) subjects were affected with recurrent RTI. In past three months, maximum mean episode and standard deviation of incidence of recurrent respiratory infections were 4.5 ± 0.8389 in 06 months - 2 years. Subjects under 05 years of age are more vulnerable to RTI. In Ayurveda also, it is mentioned that due to Kapha Dosha predominance, the chance of getting Vikara of Kapha Sthan as like, Urah is more. It is also documented that the overall incidence of acute respiratory infection in the under-5 years may be between 3 and 8 episodes/ child/ year.¹⁰

Children who had experienced more than 3 episodes in the last 3 months were considered as a subject for recurrent fever. Maximum 9 (20.45%) were affected in the age group 6 months - 2 years followed by 28 (14.58%) were affected in the age group 4 years - 5 years. In past three months, maximum mean episode and standard deviation of incidence of recurrent fever were 4.4 ± 1.121 in age group 3 years - 4 years. The present finding reveals that lower immunity in children leads to recurrent infections and recurrent fever as a result.

Children who had experienced more than 3 episodes in the last 3 months were considered as a subject for recurrent diarrhea infections. Maximum 8 subjects (18.18%) were affected in the age group 6 months – 2 years. In past three months, the maximum mean episode and standard deviation of incidence of recurrent diarrhea episodes were 5 ± 1.069 in 06 months - 2 years. Poor sanitation, worm infestations, contaminated water, the poor

hygienic condition leads to recurrent infection and poor immune system. It is also documented that acute diarrhea constitutes a leading cause of morbidity and mortality among children below 5 years of age in developing countries. On average, 3.3 episodes of diarrhea are experienced per child per year, but in some areas the average exceeds 9 episodes per year. More than 2 million deaths are estimated to result each year as a consequence of diarrhea disease in under-fives.¹¹

Maximum 20 (45.45%) were having clinically pallor in the age group 06 months – 2 years. The present finding is in equivalent to the fact that anemia is widely prevalent and is a major cause of morbidity. Globally anemia affects 1.62 billion people which correspond to 24.8% of the population. The highest prevalence is seen in preschool age children (47.4%) Various surveys including the “National Family Health Survey (NFHS)” have revealed that anemia is highest in children below 6-35 months of age.¹²

In age group 06 months – 2 years, 01 (2.27%) subject was reported with H/O skin infection, in age group 2 years – 3 years, 03 (2.4%) subjects were reported, in age group 3 years – 4 years 05 (3.57%) were reported and in age group 4 years – 5 years maximum 8 (4.17%) were reported with H/O skin infection. On statistical analysis relation between age and prevalence of skin infections was found Not Significant ($P > 0.05$). The main reason for this type of distribution was found due to unhygienic conditions prevalent in the rural community.

In the demographic study, only these four areas of oral disease were taken. Total 96 (19.16%) subjects were suffering from oral diseases out of them, maximum 44 (8.78%) were having dental caries, 33 (6.59%) were suffered from mottled enamel, 07 (1.4%) with bleeding gum, and 12 (2.4%) were found with angular stomatitis/cheilosis. All children with oral diseases belonged to semi-urban and rural areas. The main factors responsible for the occurrence of oral diseases were poor hygiene and improper oral cleaning practices.

Hair change was found in 42 Subjects, 14 Subjects with koilonychia, 08 Subjects with a deformity in long bone, and 04 Subjects with beading of Costochondral Joints. The main factors responsible for the occurrence of other morbidity were malnutrition, improper diet intake pattern and intake of no nutritious diet, poor hygiene and improper oral cleaning practices, etc.

CONCLUSION

The study finding shows that recurrent respiratory tract infections and recurrent diarrhea infection are major forms of morbidity in children of the survey villages. Recurrent fever, anemia, skin infections, and oral diseases are also affecting the morbidity status of survey villages. Low socioeconomic status, poor hygiene, illiteracy, less sanitary facilities and incomplete immunization are the chief predisposing factors of poor immunity in rural areas along with poor nutrition. Children with *Vata-Kapha* predominant *Shareerika prakriti* are more prone to high morbidity rates.

To improve the situation, public education about the mode of infections and maintenance of hygiene is of great importance and

should be imparted through periodic meeting addressed to health professionals including doctors and nurse working in the community. Hence an attempt has been made in this demographic study to look for the morbidity pattern in children under 5 years in various villages in periphery of Jaipur and Swarnaprashana camps and health checkup camps in various preschools situated in Jaipur were organized by PG Department of Kaumarabhritya, NIA and Jaipur.

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