Prevalence of O and H Agglutinins for *S. Typhi* in Healthy School Children 5-11 years : A Cross Sectional Survey

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The clinical presentation of typhoid fever in children is rather vague and non-specific. Although blood culture is the gold standard for the definitive diagnosis, its positivity is only 45-50% in the best of institutions and the results are available only after 3-5 days. Recently, co-agglutination and counter immunoelectrophoresis have been advocated for the rapid diagnosis of typhoid fever(1,2). However, Widal test is routinely used as a reliable diagnostic test of typhoid fever. Currently, in most hospitals 'O' agglutinin levels of 1:100 or above are considered diagnostic, based on observations made many years ago. In an endemic area, like Madras city, it becomes necessary to update the cut-off level for diagnosis, particularly in children. This study was therefore, undertaken to know the prevalence of antibody titre for *S. typhi* in children with a view to assess the serologic values for diagnosis of typhoid fever.

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Subjects and Methods

The study was a cross-sectional survey of unvaccinated healthy school children selected at random among 5-11 years of age attending the school health cell of the Institute of Child Health and Hospital for Children, Egmore, Madras. They were from Private, Government and Corporation schools of Madras city. Children with a history suggestive of infection of typhoid fever or TAB vaccination within the past six months were excluded. Weight was recorded to the nearest 0.5 kg and their nutritional status assessed as per the IAP recommendation. Venous blood, 2 ml was drawn and Widal test performed in the Microbiology Laboratory of the Hospital using the standard technique by a single trained person to minimize the observer variation. Antigens used were prepared from JT 57 and JT 58 for 'H' and 'O' antigens, respectively by the King Institute of Preventive Medicine, Madras. Both positive and negative controls were included in the test(3).

Results

Of the 133 school children recruited for the study, 52.6% were boys. As to the nutritional status, 40.6% were normal, 51.1% were of Grade I PEM and 8.3% were of Grade II PEM. Distribution of prevalence of agglutinins as per age (*Table I*) shows that children more than 7 years old only were having titres 1:50 or more. Level of 1:100 was observed in 3% of children. There was no difference in the distribution of titres among various grades of nutritional status.

Discussion

Although Widal test has gained in-

TABLE I—*Prevalence of 'O' and 'H' Agglutinins in School Children*

Age (yr)	Negative	No. of children with antibody titre of								Total
		25		50		100		200		
		O	H	O	H	O	H	O	H	
5	12	0	0	2	2	0	0	0	0	14
6	17	0	0	0	0	0	0	0	0	17
7	20	0	0	0	0	0	0	0	0	20
8	16	0	0	1	1	3	2	0	1	20
9	18	0	0	0	0	0	0	0	0	18
10	20	0	1	4	3	1	1	0	0	25
11	15	2	3	2	1	0	0	0	0	19

creasing credibility as a reliable serodiagnostic test for typhoid fever, there has been disagreement about the diagnostic level. These could arise due to differences in antigens used, laboratory techniques and personnel as well as endemicity of the disease. Some workers have suggested a titre of 1:100 and above of 'O' agglutinin for the serodiagnosis of typhoid fever(4,5). In developed countries even a titre of 1:40 is significant(6,7). In developing countries a four-fold increase or atleast rising titre is of reliable diagnostic value. This is not always feasible and shall not be of clinical use to the patient.

Though the number is small in some age groups, titres more than 1:100 are seen after 7 years of age. In endemic areas, a titre 1:100 or even 1:200 in unimmunized children is not uncommon(8). This is probably due to subclinical infection, non-typhoidal salmonella infection or other Gram negative infection which have cross reacting 'O' antigen. We suggest that in endemic area 'O' agglutinin for *S. typhi* 1:200 or above can be considered diagnostic. Values of 1:100 have to be considered and interpreted along with the clinical findings.

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