

Are Non-Specific Reactions to Tuberculin Common?

Pages with reference to book, From 243 To 244

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Abstract

Three thousand four hundred eighty-five BCG scar negative school children were given tuberculin test. Results showed very little non-specific reactions, suggesting BCG should produce high levels of protection in our population (JPMA 45:243,1995).

Introduction

Two types of naturally acquired tuberculin sensitivity patterns/reactions are found in many human populations. A high grade of sensitivity is designated as specific and a low grade non-specific for tuberculosis infection. The incidence of the latter has been estimated to range from 10% in Denmark and North USA to 70-90% in Philippines, Sudan, Vietnam and some parts of India^{1,2}. Specific reaction is the kind found in tuberculosis patients. It has a uniform pattern and varies only in prevalence but not in degree in different countries, whereas non-specific reactions vary both in the degree, intensity and prevalence. Environmental mycobactera have often been implicated as their causative factor³. A high degree of non-specific sensitivity not only confuses the diagnostic value of tuberculin test but has also been cited as a reason for low protection following BCG vaccination in South India. It has been suggested that while prior exposure to some environmental mycobacteria enhances the protective efficacy of BCG exposure to other species may oppose it. These species act by invoking one of the two types of cell mediated responses⁴ of different protective efficacy. One type corresponds in extreme situations to the "Kochs" phenomenon, whose mechanism is unknown whereas the other to a "Listeria" type in which macrophages activating T. lymphocytes are found. In practice the response of each individual is the blend of the two. Exposure to environmental organisms may pre-determine this blend, depending on the type of response which it invokes. The tissue damaging "Kochs" component, blocks the ability of a subsequent BCG vaccination, while a "Listeria" type response potentiates it. Since BCG forms the cornerstone of tuberculosis control in Pakistan, a study was designed to estimate the prevalence of specific and non-specific reactions amongst the non-vaccinated school children in Karachi.

Subjects and Methods

Entire population of a cross section of Karachi, primary and secondary schools was examined for BCG scars. Those with no scars (presumed non-vaccinated) were Mantoux tested with 1 TU of RT, 23 with tween 80 supplied by N.I.H. Islamabad. 0.1 ml of tuberculin was injected intradermally on the dorsal surface of left fore arm and induration measured in m.m after 72 hours. Disposable Mantoux syringes with 27 gauge, half inch needles were used. All injections and reading of results were done by one of us.

Results

Three thousand four hundred and eighty-five children were found without BCG scar. Sixty-seven percent were between 10-14 years of age, while 15% formed 5-9 years and 18% 15-19 years age group.

76% of 2,340 children in 10-14 years age group showed no reaction and were designated as '0' m.m, 112 (5%) showed induration of 6 m.m, 23 (1%) 8m.m, 118 (5%) 10mm and 296 (13%) over 10 mm. There were no reactions between 1-5 m.m. Other groups showed similar pattern. Specific reactions were seen in 10% of 5-9 years age group, 18% of 10-14 and 31% of 15-19 years age groups (Table).

Table. Specific reaction seen in different age group.

Age		Reactions in m.m.							Specific
		0	2	4	6	8	10	>10	
5-9	506	437	-	-	11	6	14	38	52
	15%	86%	0	0	2%	1%	3%	8%	11%
10-14	2340	1791	-	-	112	23	118	296	414
	67%	76%	0	0	5%	1%	5%	13%	18%
15-19	639	419	-	-	16	9	63	132	195
	18%				3%	1%	10%	21%	31%
	3485	2647	-	-	139	38	195	466	661
	100%	76%			4%	1%	6%	13%	19%

Discussion

Reactions amongst scar negative cases showed a bimodal distribution (Figure),

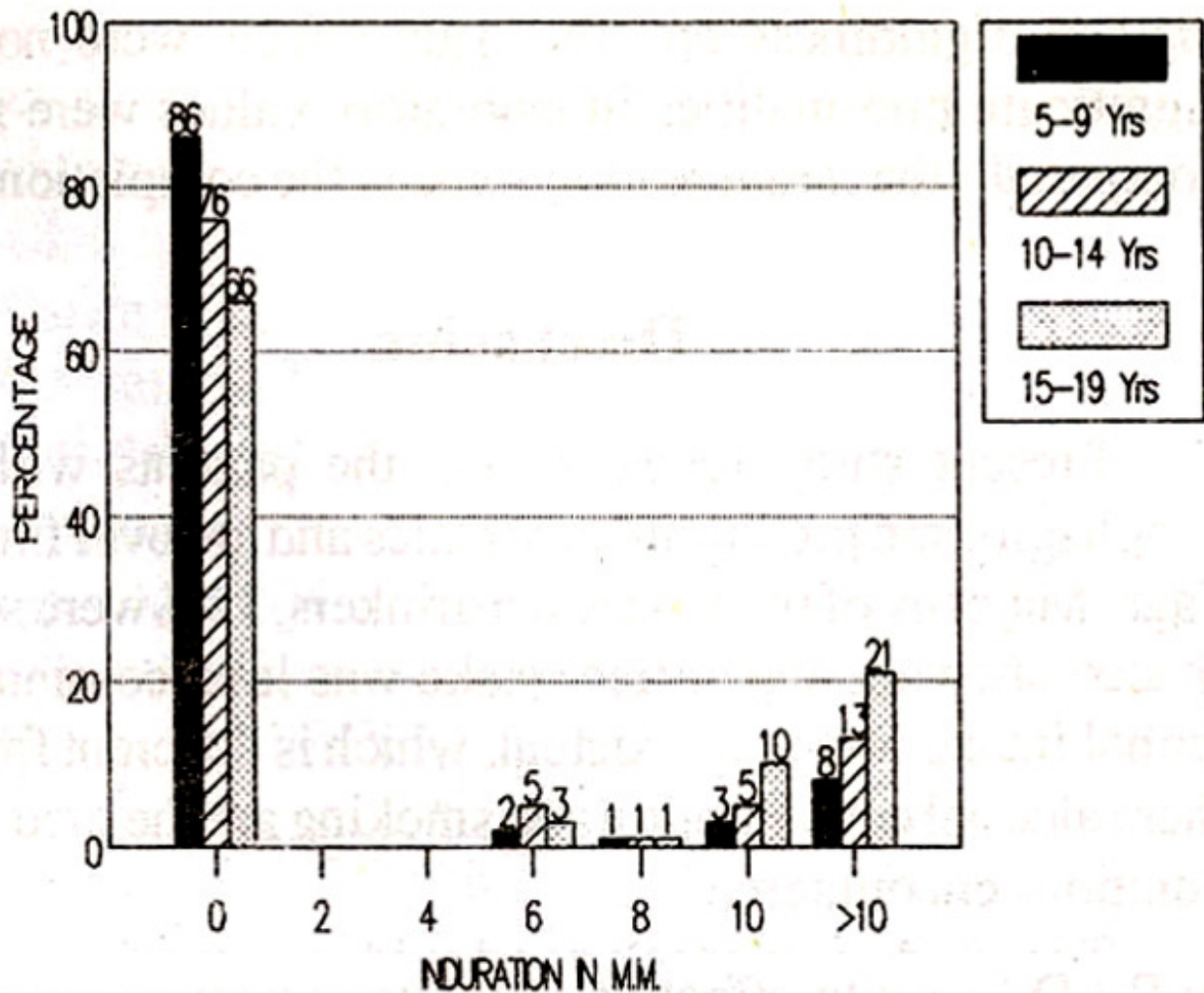


Figure. Tuberculin test specific and non-specific reaction (Scar - VE).

reactions falling mainly in two groups. One group on the left showed no reactions and one on the right showed an induration of 10 m.m or more. There were very few reactions in the intermediate group. When this situation is compared with population infected with tuberculosis⁵ in which 93% of reactions fell in the 10 m.m and overage group showing specific reactions, it seems that non-specific reactions are not common in our population and environmental mycobacteria do not play any significant role. With low degree of non-specific sensitivity, there is little tendency for the left hand group of reactions spilling over in the intermediate zone. Hence the separation of non specific from specific sensitivity is also more clearly demarcated. Non-specific sensitivity due to environmental mycobacteria has been considered to influence the level of protection conferred by BCG vaccination. Absence of this sensitivity in our population should rule out a lot of these problems with the BCG and it is presumed that BCG should produce a high degree of protection, unlike the case in South India.

References

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