4. THE TUBERCULIN

Tuberculins are immunobiologicals whose potency, specificity, antigenicity and stability varied from laboratory to laboratory and even from batch to batch prepared in the same laboratory in a manner which was difficult to predict and impossible to control. This necessitated the production of a large batch of tuberculin, which would eliminate the need for repeated standardization. Accordingly, a large batch of tuberculin-Purified protien derivative (PPD) was prepared in 1955 at the SSI in an agreement with UNICEF. The tuberculin lot prepared amounted to 670 gms and was designated PPD RT 23. About 33 billion doses of tuberculin could be administered from this single large batch. The dry powder from SSI was also supplied to India where it has been maintained by BCG vaccine laboratory, Guindy, Chennai. It is reconstituted in isotonic buffer solution and supplied in 5 ml vials as a ready to use preparation and 0.1 ml of tuberculin corresponds to 1 tuberculin unit (1 TU).

The standard tuberculin test recommended by WHO was administration of intradermal injection of 1 TU of PPD RT 23 with Tween 80 (PPD RT 23). Most tuberculin surveys in India have been conducted using 1 TU of PPD RT 23 with Tween 80 supplied by BCG laboratory, Guindy. However, a loss in the potency of 1 TU dose has recently been reported from one of the countries. But, the various tuberculin surveys conducted in this country as well as the results of tuberculin tests among confirmed TB cases over the years have not suggested any such loss in the potency of 1 TU PPD RT 23 dilutions prepared by the BCG lab, Guindy [IJTLD 2003, 7(2): 172-179]. Nevertheless, some countries have recently started using 2 TU of PPD RT 23 for their tuberculin surveys. Some investigators also reported that the dilutions prepared in individual country laboratories might have lower potency compared to the dilutions prepared by SSI. In order to decide on the appropriate dose and product of PPD RT 23 to be used for the survey, a group of smear positive pulmonary TB patients and a group of apparently healthy children were subjected to dual tuberculin tests employing different doses (1 TU, 2 TU) and dilutions prepared by BCG Lab, Guindy as well as SSI. The sensitivity of these doses and products was found to be similar as indicated by the results of dual tests among smear positive cases. However, there was suggestion of a loss in the specificity of the test with 2 TU when compared to 1 TU, as revealed by dual tests among children [IJTLD 2003, 7(2): 172-179].

In view of the above, it was decided to use 1 TU dose of PPD RT 23 with Tween 80 dilutions prepared at BCG Laboratory, Guindy for the present survey. The BCG Lab, Guindy, supplied the PPD RT 23 as 5-ml vials. These were air lifted from Chennai to the survey districts or nearest airport. The vials were kept under refrigeration at 4-8^{o} centigrade and carried to the field areas in vaccine carriers. The vials were used within the expiry period of one year.

In each of the zones, 4-6 batches of PPD RT 23 dilutions supplied by BCG laboratory were used. As a routine procedure, the potency and sterility tests were carried out in animal model by BCG laboratory, Guindy, prior to their supply. In addition, the different batches of tuberculin used for the survey were tested among smear positive patients to find out any

variation in the potency of different batches. With each of these batches, 75-100 smear positive cases were test read within one week of being found positive on sputum microcopy. The frequency distribution of reaction sizes was found to be unimodal. Table 4.1 shows the means and modes of reactions, and the sensitivity of the test employing different batches, at the cut-off points used for estimating prevalence of infection among children. The small variation on the above parameters is attributable to inter-reader as well as intra-reader variability and the results suggest that the different batches of PPD RT23 used in the survey were of uniform potency.

Tuberculin reading in Progress

Table-4.1 : Results of tuberculin tests among smear positive cases

Zone	Batch No.	No. Satisfactorily Test read	Mode (mm)	Mean (mm)	Sensitivity at	
					14 mm	15 mm
North	123E	102	22	18.7	86.2	82.3
	124B	103	24	21.4	93.2	91.3
	127B	99	20	18.0	87.0	83.0
	128A	94	22	21.0	93.9	92.0
	125B	91	20	17.5	83.5	80.2
West	125A	95	22	21.0	93.8	91.3
	122C	128	22	19.9	82.8	78.1
	125C	102	20	18.6	91.2	90.2
	127B	99	20	18.0	87.0	83.0
	129B	96	20	17.5	86.4	84.3
	129E	75	23	20.0	86.6	86.6
East	129E	75	23	20	86.6	86.6
	131B	94	18	17.8	83.0	81.9
	135B	87	22	19.7	94.0	94.0
	132D	98	20	20.0	88.7	87.0
South	122A 123A 124C 127A 127C	508	20	18	90	83