

BCG PPD 1TU, 2TU 5TU

= Abstract =

The Effect of Percutaneous Multiple Puncture BCG Vaccination on
PPD 1TU, 2TU and 5TU Tuberculin Skin TestBo Sun Kim, M.D., Min Ho Hwang, M.D., Chang Hwi Kim, M.D.
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Purpose : Recently in Korea since 1998, 2TU has been used instead of 5TU, which caused a confusion in interpreting tuberculin skin tests. We compared the tuberculin skin reaction to PPD(purified protein derivatives) 1TU, 2TU and 5TU.

Methods : We studied tuberculin skin reaction to PPD 1TU, 2TU and 5TU on 92 infants who were vaccinated with percutaneous multiple puncture BCG vaccine(Tokyo 172 strain, Japan BCG Laboratory Co.) in neonatal period. Diameters of indurations were measured in millimeters 48-72 hours after the intradermal injection of PPD 1TU, 2TU and 5TU.

Results : Among 92 infants(male : 56, female : 36), 1TU was used on 31 infants, 2TU on 31 infants and 5TU on 30 infants for tuberculin skin test. The mean diameter of induration for PPD 1TU, 2TU and 5TU were 5.7 ± 4.2 mm, 7.1 ± 3.7 mm, and 9.2 ± 4.2 mm, respectively. There was no statistical difference in mean diameter of induration between 1TU and 2TU. However, when tested with 5TU, the diameter of induration was significantly larger than those of PPD 1TU and 2TU($P < 0.05$). Six subjects(19.4%) tested with 1TU, 9 subjects(29%) tested with 2TU and 16 subjects(53.3%) tested with 5TU had diameter of 10 mm or more. There was no statistical difference between 1TU and 2TU but for 5TU, number of subjects with diameter of 10 mm or more was significantly higher than PPD 1TU and 2TU($P < 0.05$). Number of subjects with induration diameter of 5 mm or more for 1TU, 2TU and 5TU was 19(61.3%), 22(71.0%) and 26(86.7%), respectively. However, there was no statistical difference.

Conclusion : A new standard criteria for interpreting the tuberculin skin test with PPD 2TU should be established for clinical diagnosis of tuberculosis.

Key Words : Tuberculin skin test, Percutaneous multiple puncture BCG

(Tokyo 172 strain, Japan BCG Laboratory Co.)
 BCG 3
 4 PPD 1TU, 2TU
 5TU 92 (:56
 , :36) (Table 1).
 2 .
 1965 5.1% 1985 2.5%, 1990
 1.8%^{1, 2)} , 1995
 30.8%, 0.8%
 3) .
 BCG(Bacille Calmette-Guérin) BCG
 1921 4) 1.5 cm,
 3 cm
 5 mm 가 9 가
 2 cm 가
 4 French
 Tokyo 가
 T-
 tuberculoprotein
 5 7) . 5TU PPD(purified protein derivatives) 1TU
 가 1998
 5TU 2TU
 . 2TU 5TU
 가
 (induration)
 mm
 4
 BCG
 PPD 1TU, 2TU 5TU
 3 .
 SPSS 10.0
 ANOVA Chi-square test
 $P<0.05$
 1 .
 2000 1 2000 8 8
 가 ,
 ,
 4
 92 (:56 , :36) 31
 1TU, 31 2TU 30 5TU

(Table 1).			5TU PPD		
1TU	가 0 mm	가 가	($P<0.05$)(Table 3).	가 5 mm	
	7 mm, 6 mm	.	ITU, 2TU, 5TU가	31	19
2TU	8 mm가 가	3	(61.3%), 30	22 (71.0%), 30	26 (86.7
mm, 6 mm, 10 mm가	.	5TU	%) 5TU 가		
mm 6 mm	가 가	(Fig. 1).	(Table 3).		
PPD 1TU, 2TU 5TU					
5.7 \pm 4.2 mm, 7.1 \pm 3.7 mm,					
9.2 \pm 4.2 mm	ITU 2TU				
	가	5TU			
PPD 1, 2TU		가			
($P<0.05$)(Table 2).					
PPD TU					
	가 10 mm				
1TU	31	6 (19.4%), 2TU	31		
	9 (29%), 5TU	30	16 (53.3%)		
ITU 2TU		가			

Table 1. Characteristics of Study Subjects

Sex	No.(%)
Male	56(60.87)
Female	36(39.13)
PPD TU	
ITU	31(33.55)
2TU	31(33.55)
5TU	30(32.90)

No. : No. of subjects

Table 2. Comparison of Induration Size According to PPD TU

	ITU	2TU	5TU
Induration(mm)	5.7 \pm 4.2	7.1 \pm 3.7 [†]	9.2 \pm 4.2 [*]

Values are mean \pm standard deviation, ^{*} $P<0.05$ compared with PPD 1TU and 2TU by ANOVA test, [†] P 0.05 compared with PPD 1TU by ANOVA test

Table 3. Comparison of Reactivity to Mantoux Test According to PPD TU after Percutaneous Multiple Puncture BCG Vaccination

Diameter of induration	No. of subjects(%)		
	ITU	2TU	5TU
10 mm	6(19.4)	9(29.0) [*]	16(53.3) [†]
5-9 mm	13(41.9)	13(42.0)	10(33.4)
<5 mm	12(38.7)	9(29.0)	4(13.3)
≥ 5 mm	19(61.3)	22(71.0)	26(86.7) [†]

^{*} P 0.05 compared with PPD 1TU, [†] $P<0.05$ compared with ITU and 2TU, [†] P 0.05 compared with PPD 1TU and 2TU

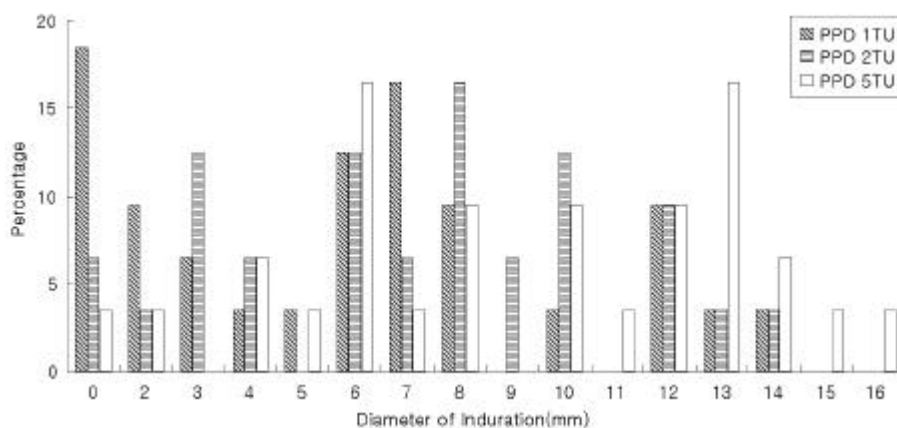


Fig. 1. Distribution of induration diameter according to PPD TU.

- 가 1TU . 가 .
- PPD 2TU
- ¹⁴⁾ 106 5TU 2TU
- 2TU
- 10.3 mm , 5TU : 1998 5TU
- 14.4 mm 2TU .
- 가 , 5TU 가 가 5TU 2TU
- 2TU 가 가 가
- PPD 2TU 4
- BCG
- 5TU PPD 1TU, 2TU 5TU
- 6 mm , 10 mm .
- : 2000 1 2000 8 8
- 가 ,
- ¹⁵⁾ 1 BCG
- 6 2TU
- 7.32 ± 3.2 mm (Tokyo strain, Japan BCG Laboratory Co.) BCG
- PPD 1TU 5TU 92 (:56 , :36)
- 4 PPD 1TU, 2TU 5TU
- ¹⁶⁾ 1 BCG
- 200 3 2TU PPD
- RT 23 5TU
- PPD RT 23 , 2TU PPD
- RT 23 가
- PPD 1TU, 5TU
- 30 5TU
- 2TU 5TU 5.7 ± 4.2 mm, ITU 가
- 7.1 ± 3.7 mm, 9.2 ± 4.2 mm 5TU PPD 1, 0 mm 가 가 7 mm,
- 2TU 가 6 mm . 2TU 8 mm가
- 2TU ITU 5TU 가 3 mm, 6 mm, 10 mm가
- PPD TU . 5TU 13 mm 6 mm가 가
- 가 10 mm ITU 2TU
- 가 5TU
- PPD
- 가 5 mm ITU, 2TU, 5TU
- 가 5TU 가
- ($P < 0.05$).
- 3) 가 10 mm ITU
- 31 6 (19.4%), 2TU 31 9
- (29%), 5TU 30 16 (53.3%)

1TU 2TU 가 5TU
PPD 1, 2TU ($P <$
0.05). 가 5 mm
5TU 가
. BCG 1TU 13.81 ± 4.48 ,
2TU 13.06 ± 4.18 , 5TU 13.07 ± 3.07
가 .
:
2TU
가
가 .

- 1) . , 37 . :
 , 1991:12-4.
- 2) , . 6
 . 1991:23.
- 3) , . 7
 . 1995:8-12.
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- 10) . . 7 . :
 , 2001:429-39.
- 11) . RT 23 PPD 2TU .
 1998;41:1309.
- 12) , , . BCG
 .
 1997;40:489-95.
- 13) , , .
 . 1998:
 1-44.
- 14) , , , . 2TU 5TU
 . 2000;
 43:638-43.
- 15) , .
 BCG 2TU
 1999;6:101-6.
- 16) , . BCG
 2TU PPD RT23
 2000;43:1418-22.