Letter to the Editor

Early conversion of tuberculin skin test in medical students who begin hospital practices

Dear Editor,

Unperceived exposure to patients with tuberculosis (TB) is a common event in training staff in hospitals in high incidence countries, the risk of acquiring the disease at the hospital setting being 2–50 times higher than in the community.[1] Although medical students are a risk group for acquiring TB infection, most of all during the first months of contact with the hospital, neither universities nor teaching hospitals have guidelines or protocols to minimize it. To quantify this risk, we evaluate the early conversion of the tuberculin skin test (TST) as an indicator of primary TB infection in medical students after the beginning of their hospital practices.

The study population comprised medical students assigned to start their clinical practices in Reference Hospitals of Ministry of Health (MOH) or Social insurance (ESSALUD) in 2008. We obtained baseline data on gender, age, TB contact, body mass index (BMI) and use of N95 particular respirators masks during their clinical practice. The application of the TST was conducted according to national guidelines.[2] For those students with negative TST (defined as <10 mm induration) the procedure was repeated three months thereafter.

For descriptive analysis, numeric variables are presented as medians and interquartile ranges, while categorical variables are presented as frequencies and percentages. Variables associated with TST conversion were assessed through Mann–Whitney, chi-square or Fisher exact test for numerical and categorical variables, respectively. The study was approved by the University Ricardo Palma and the ethics committee of Hospital Hipólito Unanue.

We included 60 students, 30 from the MOH hospital and 30 from the ESSALUD hospital. Out of them, 34 (57%; 95% CI 43–69%) were female; the median age was 21.5 years (IQR 20–24 years). None of the baseline characteristics differed between participants with positive ($n = 23$) and negative ($n = 37$) initial TST results. The second (after three months) TST applied to those students with an initial negative result was positive in 19 (51.4%; 95% CI 34–68%). The positivity rate at the third month was 65% for students from the MOH hospital compared to 35% for students from ESSALUD ($p = 0.07$, Table 1), representing a relative risk of 1.86 (95% CI 0.90–3.78). Relative risk associated with being male was 2.01 (95% CI 1.03–3.95).

The most relevant finding of our study was the high rate of earlyconversion of the tuberculin test in the group of evaluated

Table 1 – Characteristics of participants according to the tuberculin skin test (TST) result three months after an initial negative TST.

Variable	Total ($n = 37$)	TST at 3 months		p-value
		Positive ($n = 19$)	Negative ($n = 18$)	
Age	21 (20–24)	22 (20–24)	21 (20–22)	0.46
Male gender	17 (46.0)	12 (63.2)	5 (27.8)	0.03
Tuberculosis contact	16 (43.2)	12 (63.2)	9 (50.0)	0.42
Body mass index	21.6 (20.3–24.6)	22.3 (20.8–26.2)	21.5 (19.7–23.8)	0.34
Ministry of health training hospital	20 (54.1)	13 (68.4)	7 (38.89)	0.07[a]
Use of particulate respirator	16 (43.2)	7 (36.8)	9 (50.0)	0.42

Median and interquartile range are shown for numerical variables. Frequencies and percentages are shown for categorical variables. TST, tuberculin skin test.

[a] vs. social insurance hospital.

students who began their hospital practice. It was also found that being male and doing medical practices in the MOH hospital were associated with a greater conversion rate of TST. This indicates that medical students in our setting represent a high risk population for acquiring TB infection. Indeed, positivity rates of TST are strikingly high compared with other series in which the annual conversion ranged from 8 to 17%.[3,4] This difference is especially dramatic considering that our study evaluated the early conversion (three months). However, our conclusions are limited by the small sample size and the potential booster effect that may have overestimated the number of converters.[5]

In conclusion, our findings indicate a high incidence of TB infection among students early in their clinical practice, particularly in hospitals of the MOH. This population group should be evaluated periodically in search for latent TB infection in order to promptly start isoniazid preventive therapy and both universities and health facilities should take responsibility of this. Performing annual TST may be too late for the treatment of latent tuberculous infection in students who start their clinical practices in hospital settings in countries with high incidence of TB.

Conflict of interest

All authors declare to have no conflict of interest.

REFERENCES

1. Accinelli T, Noda M, Bravo P, Galloso B, López O. Enfermedad tuberculosa entre trabajadores de salud. Acta Méd Peruana. 2008;26:35–47.

2. Estrategia sanitaria nacional de prevención y control de la tuberculosis. Norma técnica de salud para el control de la tuberculosis. Ministerio de Salud; 200633–8.

3. Hohmuth B, Yamanija J, Dayal A, Nardell E, Salazar J, Smith M. Latent tuberculosis infection: risks to health care students at a hospital in Lima, Peru. Int J Tuberc Lung Dis. 2006;10:1146–51.

4. Christopher DJ, Daley P, Armstrong L, et al. Tuberculosis infection among young nursing trainees in South India. PLoS ONE. 2010;5:e10408.

5. Menzies R. Interpretation of repeated tuberculin skin tests: boosting, conversion, and reversion. Am J Respir Crit Care Med. 1999;159:15–21.

Alonso Soto [a,b,*]
[a] *General Epidemiology and Disease Control Unit, Institute of Tropical Medicine, Antwerpen, Belgium*
[b] *Department of Medicine, Hospital Nacional Hipólito Unanue, Lima, Peru*

Pahola Huablocho, Johan Ulloque
Universidad Ricardo Palma, Lima, Peru

* *Corresponding author at*: Institute of Tropical Medicine, General Epidemiology and Disease Control Unit, Nationalstraat 155, B-2000 Antwerpen, Belgium.
E-mail addresses: asoto@itg.be, sotsolari@yahoo.com
(A. Soto).