BRIEF COMMUNICATION

A RETROSPECTIVE EVALUATION OF A SCORE SYSTEM ADOPTED BY THE MINISTRY OF HEALTH, BRAZIL IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS IN CHILDHOOD: A CASE CONTROL STUDY

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SUMMARY

Based on a retrospective case-control study we evaluated the score system adopted by the Ministry of Health of Brazil (Ministério da Saúde - MS), to diagnose pulmonary tuberculosis (PTB) in childhood. This system is independent of bacteriological or histopathological data to define a very likely (> or = 40 points), possible (30-35 points) or unlikely (< or = 25 points) diagnosis of tuberculosis. Records of hospitalized non-infected HIV children at the Instituto de Puericultura e Pediatria Martagão Gesteira of Federal University of Rio de Janeiro (IPPMG-UFRJ), were reviewed. Patients were adjusted for age and divided in two different groups: 45 subjects in the case group (culture-positive) [mean of age = 10.64 mo; SD 9.66]; and 96 in the control group (culture-negative and clinic criteria that dismissed the disease) [mean of age = 11.79 mo.; SD 11.31].

Among the variables analyzed, the radiological status had the greater impact into the diagnosis (OR = 25.39), followed by exposure to adult with tuberculosis (OR = 10.67), tuberculin skin test >10mm (OR = 8.23). The best cut-off point to the diagnosis of PTB was 30 points, where the score system was more accurate, with sensitivity of 88.9% and specificity of 86.5%.

KEYWORDS: Pulmonary tuberculosis; Child; Case-control study.

Diagnosing tuberculosis in childhood is a challenge and it should take into consideration the value of clinical, radiological and epidemiological aspects. Various diagnostic approaches for diagnosis of childhood tuberculosis have been published. Most of them are based on clinical experience[3,5,6] but FOURIE *et al*.[4] used a mathematic model. Based in well-established diagnosis criteria, a arbitrary score system, currently adopted by the Ministry of Health (Ministério da Saúde, MS), was created in Brazil to diagnose pulmonary tuberculosis (PTB) in childhood[1]. This system is independent of bacteriological or histopathological data to define a very likely (> or = 40 points), possible (30-35 points) or unlikely (< or = 25 points) diagnosis of tuberculosis (Table 1). This score system was evaluated based on a retrospective case-control study. Records of hospitalized non-infected HIV children at the Instituto de Puericultura e Pediatria Martagão Gesteira of Federal University of Rio de Janeiro (IPPMG-UFRJ), that were pulmonary tuberculosis suspects and were submitted to a culture of acid fast bacillus (AFB) on their gastric smear between 1987 and 1994, were reviewed. Patients were adjusted for age and divided in two different groups: 45 subjects in the case group (culture-positive) [mean of age = 10.64 mo; SD 9.66]; and 96 in the control group (culture-negative and clinic criteria

that dismissed the disease) [mean of age = 11.79; SD 11.31]. The score system was applied to the case and control subjects, in order to calculate the values of sensitivity and specificity and the odds ratio (OR) of each one of the variables of the system: clinical radiological status, exposure to adult with tuberculosis, tuberculin skin test and nutritional status. Patients younger than one-year-old (69.5%) and males (61.7%) were predominant. Among the variables analyzed, the radiological status had the greater impact into the diagnosis (OR = 25.39), followed by exposure to adult with tuberculosis (OR = 10.67), tuberculin skin test >10 mm (OR = 8.23). It was noticed that 40 (88.9%) cases and 23 (24.0%) controls had radiologic abnormalities suggesting tuberculosis, as well, 36 (80.0%) cases and 38 (39.6%) controls had prolonged fever. It was detected that 16/44 (36.4%) case subjects and 20/96 (20.8%) control subjects had not been vaccinated with BCG and that, among the 36 patients that were not vaccinated, 29 were younger than one-year-old. The absence of BCG vaccination indicated risk (OR = 2.17) of diagnosis of pulmonary tuberculosis. The tuberculin skin test was < 5 mm in 16/27 (59.52%) case subjects and 47/49 (95.9%) control subjects. Malnutrition was noticed in 28 (62.2%) cases and 61 (63.5%) controls. The best cut-off point to the diagnosis of PTB was 30 points, where the score system

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Table 1
Score system for diagnosis of pulmonary tuberculosis in children (Ministry of Health, Brazil) in cases and controls

		SCORE	CASES	CONTROLS	OR	CI 95%
Clinical manifestations	Fever or cough, lost energy, sputum, lost weight, night sweats > 2 weeks.	+15	39	44	7.68	2.77-22.38
	No symptoms or symptoms < 2 weeks	0				
	Respiratory infection improving with or without antibioticotherapy for common bacteriae	-10	6	52		
Thoracic x-ray	◆ Enlarged hilum or miliary pattern ◆ Exsudate or patch shadow (with or without cavitation) unaltered > 2 weeks or worst with antibioticotherapy for common bacteriae.	+15	40	23	25.39	8.27-83.55
	Exsudate or patch shadow (with or without cavitation) < 2 weeks.	+5	5	73		
	Normal	-5				
Contact with tuberculous adult	Close, < 2 years	+10	32	19	10.67	4.32-26.92
	None or occasional	0	12	76		
BCG vaccination and Tuberculin test	BCG > 2 years or no BCG > = 10 mm	+15	7	–	19.90	2.39-438.30
	BCG < 2 years > = 15 mm	+15				
	BCG yes/no 5 mm to 9 mm	+5	38	96		
	BCG yes/no = < 5 mm	0				
Nutritional status	Severe malnutrition (grade III)	+5	28	61	0.85	0.43-2.10
	Eutrophic or no severe malnutrition	0	17	35		

Score interpretation: ≥ 40: very likely PTB; 30 – 35 : possible PTB; ≤ 25: unlikely PTB

Table 2
Final Score and Diagnostic of Pulmonary Tuberculosis (PTB)

Score	Case		Control		Total		OR	CI 95%
	n	%	n	%	n	%		
≥ 40	26	57.8	2	2.1	28	19.9	64.32	13.05-429.92
30–35	14	31.1	11	11.4	25	17.7	51.08	15.46-181.76
≤ 25	5	11.1	83	86.5	88	62.4		
Total	45	100.0	96	100.0	141	100.0		

OR: Odds ratio

was more accurate, with sensitivity of 88.9% and specificity of 86.5% (Table 2). The score system proved to be important in this retrospective case control study in the diagnosis of PTB in hospitalized children. In the future, the implementation of new studies to evaluate this score in a prospective study including hospitalized as well out patients will be appropriate[2].

RESUMO

Avaliação retrospectiva de sistema de pontuação pelo Ministério da Saúde do Brasil, no diagnóstico de tuberculose pulmonar na criança: estudo controle de casos

Avaliou-se o sistema de pontuação adotado pelo Ministério da Saúde do Brasil para o diagnóstico de tuberculose pulmonar (TP) na infância através de estudo caso-controle retrospectivo. Tal sistema independe de dados bacteriológicos ou histopatológicos e define o diagnóstico de tuberculose como muito provável (> ou = 40 pontos); possível (30 a 35 pontos) ou pouco provável (< ou + 25 pontos). Foram revisados os prontuários de crianças não infectadas pelo HIV internadas no Instituto de Puericultura e Pediatria Martagão Gesteira da Universidade Federal do Rio de Janeiro; os pacientes foram ajustados por idade e divididos em dois grupos: 45 casos (cultura positiva) [média = 10,64 meses; DP 9,66]; e 96 controles (cultura negativa e sem critérios clínicos para TP) [média = 11,79 meses; DP 11,31]. Dentre as variáveis analisadas, o quadro radiológico teve grande importância para o diagnóstico (OR = 25,39), seguido pelo contato com adulto com tuberculose (OR = 10,67), teste tuberculínico > 10 mm (OR = 8,23). O melhor ponto de corte para o diagnóstico de TP foi 30 pontos, no qual houve maior acurácia do sistema, com sensibilidade de 99,9% e especificidade de 86,5%.

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