

THE PERSISTENCE OF LEPTOSPIRAL AGGLUTININS TITERS IN HUMAN SERA DIAGNOSED BY THE MICROSCOPIC AGGLUTINATION TEST

Eliete C. ROMERO (1), Cynthia R. CALY (1) & Paulo H. YASUDA (2)

SUMMARY

The persistence of agglutinins detected by MAT has created some problems to the interpretation of the results. The aim of this study was to examine the data of serology from 70 patients with serologically confirmed diagnosis of leptospirosis by during 3-13 months after being affected with leptospire in order to elucidate the interpretation of the persistence of agglutinins detected by MAT. Sixty-one patients sera (87.14%) had titers equal or greater than 800. Of these, two individuals maintained titers of 800 thirteen months after the onset. This study showed that only one sample of sera with high titers is not reliable to determine the time at which infection occurred.

KEYWORDS : Leptospirosis, Microscopic Agglutination Test ; Leptospiral agglutinins.

INTRODUCTION

Leptospirosis is one of the most widespread zoonotic diseases in the world. The definitive diagnosis of leptospirosis depends mainly on serological studies; the microscopic agglutination test (MAT) is the reference standard serodiagnostic procedure². Serological results are useful as an epidemiological tool, however, a severe limitation on the use of these information is a lack of data on the duration of leptospiral agglutinating titers in human sera. The persistence or not of agglutinins detected by MAT has created some problems to interpreting the results. Some authors suggested that MAT titers of 800, or greater, in only one sample might be considered as a confirmed case⁴. Even, the detection of specific IgM class antibodies by ELISA is problematic because IgM can persist for at least one year⁵⁻⁸. The aim of the present study was to examine the data of serology from patients with serologically confirmed diagnosis of leptospirosis during 3-13 months to provide information which would be relevant to establish serological criteria to differentiate between chronic titers associated with past infection and acute titers associated with recent illness and therefore to help the epidemiological studies.

MATERIALS AND METHODS

The MAT was performed according to the World Health Organization (WHO)² and the results expressed by reciprocal of serum dilution. An analysis was made by the study of 70 patients serologically confirmed diagnosis of leptospirosis by the standard criteria of rise titers of ≥ 2 dilutions between two samples of sera by MAT³. The patients sera samples were divided into seven groups,

according to the time of observation of the agglutinins titers, as follows: 1) 21 patients- 3 months; 2) 20 patients- 4 months; 3) 13 patients- 6 months; 4) 4 patients- 8 months; 5) 5 patients-10 months; 6) 4 patients- 12 months and 7) 3 patients- 13 months.

RESULTS AND DISCUSSION

Table 1 illustrates the different titers detected by MAT in relation to the time since the patients had symptoms of leptospirosis. It should also be noted that within the 3-13 months after being affected with leptospire, 61 patients (87.14%) had titers equal or greater than 800 (62.29 % reacted with serogroup Icterohaemorrhagiae). Of these, two individuals maintained titers of 800 (serogroups Pyrogenes and Australis) thirteen months after the onset. This study showed that the leptospiral agglutinins can persist for several months after they were first detected, although, the cause of this phenomenon is unknown. It can be suggested that the persistence of agglutinins is due either to reinfection or to some other forms of recurring antigenic stimulation. In addition, the administration of antibiotics could affect the immune response and the MAT titers. Our data is in according to the previous studies of BLACKMORE et al.¹ and the long duration of high titers has important implications for the interpretation of serological results and to establish the diagnosis of recent or past cases of leptospirosis. The persistence of antibodies in human leptospirosis is an interesting manifestation, which has also been reported in other studies by other tests⁵⁻⁸. In conclusion, leptospiral agglutinin for long time is a fact to be considered. Our study confirmed that only one sample of sera with high titer is not reliable to ascertain the time at which infection began.

(1) Adolfo Lutz Institute, Department of Medical Biology, São Paulo, Brazil.

(2) Biomedical Science Institute, Department of Microbiology, University of São Paulo, SP, Brazil.

Correspondence to : E. C. Romero, Instituto Adolfo Lutz, Av. Dr. Arnaldo 351/9º andar, 01246-902 São Paulo, SP, Brazil.

TABLE 1

Titers detected by MAT from patients sera with leptospirosis divided into seven groups in relation to the time of observation (in months) of agglutinins titers.

Group (months) \ MAT Titers	MAT Titers										Total
	200	400	800	1,600	3,200	6,400	12,800	25,600	51,200	102,400	
1 (3)		2	2	2	3	2	3	5	1	1	21
2 (4)	1			8	5	4	1	1			20
3 (6)			3	3	3	3	1				13
4 (8)			3				1				4
5 (10)		3	1		1						5
6 (12)	2		1	1							4
7 (13)		1	2								3
Total	3	6	12	14	12	9	6	6	1	1	70

RESUMO

Persistência de títulos de aglutininas anti-leptospiras em soros humanos diagnosticados pelo teste de aglutinação microscópica

A persistência de aglutininas detectadas por MAT tem criado problemas na interpretação dos resultados. O objetivo deste trabalho foi examinar os resultados da sorologia de 70 pacientes com confirmação sorológica de leptospirose durante 3-13 meses após terem sido infectados para se poder elucidar a interpretação da persistência de aglutininas detectadas por MAT. Sessenta e um soros de pacientes (87,14%) apresentaram títulos iguais, ou maiores, que 800. Destes, 2 indivíduos mantiveram títulos de 800 treze meses após terem sido infectados. Este estudo mostra que apenas uma amostra de soro, mesmo com alto título de aglutininas, não pode ser considerada para determinar a fase da doença.

REFERENCES

1. BLACKMORE, D.K.; SCHOLLUM, L.M. & MORIARTY, K.M. - The magnitude and duration of titres of leptospiral agglutinins in human sera. *N. Z. med. J.*,97:83-86, 1984.
2. FAINE, E.D. - *Guidelines for the control of leptospirosis*. Geneva, World Health Organization, 1982. (WHO offset publication no. 67).
3. FEIGIN, R.D. & ANDERSON, D.C. - Human leptospirosis. *CRC Crit. Rev. clin. Lab. Sci.*,5:413-467,1975.
4. MINISTÉRIO DA SAÚDE. - *Manual de leptospirose*. 2. ed. Brasília, Fundação Nacional de Saúde; Centro Nacional de Epidemiologia; Coordenação de Controle de Zoonoses e Animais Peçonhentos, 1995.
5. PAPPAS, A.A.; BALLOW, W.R.; GARY, M.R. et al. - Rapid serodiagnosis of leptospirosis using the IgM-specific Dot-ELISA: comparison with the microscopic agglutination test. *Amer. J. trop. Med. Hyg.*,34:346-354, 1985.
6. SILVA, M.V.; NAKAMURA, P.M.; CAMARGO, E.D. et al. - Immunodiagnosis of human leptospirosis by Dot-ELISA for the detection of IgM, IgG and IgA antibodies. *Amer. J. trop. Med. Hyg.*,56:650-655,1997.
7. SILVA, M.V.; CAMARGO, E.D.; BATISTA, L. et al. - Behavior of specific IgM, IgG and IgA class antibodies in human leptospirosis during the acute phase of the disease and during convalescence. *J. trop. Med. Hyg.*,98:268-272,1995.
8. WINSLOW, W. E.; MERRY, D. J.; PIRC, M.L. & DEVINE, P. L. - Evaluation of a commercial enzyme-linked immunosorbent assay for detection of immunoglobulin M antibody in diagnosis of human leptospiral infection. *J. clin. Microbiol.*,35:1938-1942, 1997.

Received: 03 December 1997

Accepted: 16 June 1998