DETERMINATION OF DOMINANT SEROVARS OF LISTERIA MONOCYTOGENES

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ABSTRACT

Serovars of Listeria monocytogenes were determined. Sera of aborted samples (200) were collected from different hospitals in Tehran and were tested serologically by immunofluorescent antibody methods (IF tests). 137 positive sera were identified. Positive sera were tested against 12 serovars of Listeria monocytogenes separately. Titers of antibody in patients' sera for all serovars were determined. The results showed that the dominant serovars of L. monocytogenes which caused listeriosis in the samples were 4b, 1a, 2 and 3. None of the sera had antibodies against serovars 4a, 6a or 6b. Some of the sera which had high titers of antibody against dominant serovars (4b, 1a, 2 and 3), showed a faint result with serovars 4d, 4e, 5 and 7.


INTRODUCTION

Listeria monocytogenes, a small gram positive rod which shows beta hemolysis in sheep blood agar, was first isolated by Murray et al. in 1926, as a result of their investigation of an epidemic of perinatal infection among a colony of rabbits. Since then the organism has been isolated with increasing frequency from man, particularly during the newborn period.3,6

This microorganism is pathogenic for many animals, such as mammals and birds.1 Handling of these animals and drinking infected milk cause infection in man.3,7

In 1981, 34 cases of perinatal listeriosis, including 16 deaths, occurred in the maritime province of Canada during a seven month period.4

Gray and Seeliger in 1963 first reported human infections by Listeria monocytogenes. Lashkari et al. found three positive cultures of Listeria monocytogenes among 100 abortion cases in 1974 in Iran.8 In 1979 she and her colleague reported oculeoglandular infection in Iranian patients.9 In this study, we bacteriologically tested 200 abortion samples, among which five were positive.10

This investigation was designed to find the serovars of L. monocytogenes which cause listeriosis in Iran.

The genus listeria is divided into four main serologic types and 11 subtypes (7 main types according to Seeliger).12

The detailed antigenic structure of Listeria species was studied by L. Grayi and L. Murrayi.12

MATERIALS & METHODS

Samples obtained from 200 aborted cases were tested serologically to determine whether the sera have antibody against Listeria monocytogenes. Positive sera were stored at -70°C.

Plasma protein-antisera (gammaglobulin-fraction) fluorescein conjugate was obtained from Behring. All the reagents were prepared in PBS (Phosphate Buffered Saline, pH 7.6).

Serogroups of 1a (PTCC 1294), 2 (PTCC 1295), 3 (PTCC 1296) 4a (PTCC 1297), 4b (PTCC 1298), 4d (PTCC 1301),
Serovars of *L. monocytogenes*

Serovars 4e (PTCC 1302), 5 (PTCC 1303), 6a (PTCC 1304), 6b (PTCC 1305) and 7 (PTCC 1306) of *Listeria monocytogenes* were kindly donated by Persian Type Culture Collection (PTCC).\(^1,2\) Serogroups of *L. monocytogenes* (antigens) were cultured and fixed on slides for immunofluorescent antibody (IF test). Sera were added on the slides of antigens, and excess sera were washed off with PBS.

Fluorescein conjugated antibody was added to the slides to check the positive sera reaction. Excess antibody was washed and the preparation was examined by the fluorescence microscope.\(^1,2\)

**RESULTS**

From August 1989 to 1990, 137 sera of patients who had antibody against *L. monocytogenes* by IF tests were collected. 200 mothers who had aborted their fetuses were selected. Some of these patients had had more than one abortion.

The sera were tested against 12 serovars of *L. monocytogenes* separately. Titters of antibody against serogroups of *L. monocytogenes* in blood of patients were determined (Table 1).

**DISCUSSION**

The present investigation was designed to determine the serovars of *Listeria monocytogenes* which cause serious infection in Iran. We tested 200 sera of mothers who had aborted. Out of the tested samples, sera were separated. These samples had positive IF tests against *L. monocytogenes*. The positive sera were then tested against 12 serovars of *L. monocytogenes*.

All the sera showed negative IF reaction for serovars 4a, 6a and 6b. A faint (weak) result was obtained with serovars 4d, 4e, 5 and 7, with titres of 400 and 800.

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