New Serotypes of Group B Streptococci Isolated from Human Sources

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Antisera raised in rabbits against two nontypable group B streptococci, which were not agglutinable in a specific group B antiserum, were tested with acid extracts of 78 nontypable human group B streptococci. One antiserum (12351) reacted with 15 strains, and the other (7271) reacted with only 2 strains. Antiserum to Wilkinson’s strain SS 1169 (NT 1) reacted with three strains. Antiserum against strain 12351 appears to be a useful antiserum against a new type antigen, which is probably polysaccharide in nature.

Approximately 10% of the group B streptococci isolated from various human sources in Denmark during the last 16 years were nontypable (NT); i.e., they did not belong to any of the four known serological types based on polysaccharide antigens: Ia, Ib, II, and III. Nor did they belong to type Ic, which has the polysaccharide-type antigen Ia in common with type Ia and the protein antigen Ibc in common with type Ib (7).

Recently, Wilkinson (6) reported that, of antiseras raised against eight NT strains, two were specific for antigens that probably were polysaccharides. One (NT 6) was strain specific, and the other (NT 1) appeared to be type specific. This antiserum, however, only reacted with 5 of 53 NT strains tested.

We raised antiseras against two NT group B streptococcal strains, as well as against the strain (SS 1169) used by Wilkinson to produce her new type-specific antiserum (NT 1). Our two strains (12351 and 7271) were chosen because they grew with even turbidity in broth and did not agglutinate in a specific group B antiserum not containing type antibodies, which in our experience is a combination of characteristics commonly found in strains rich in type-specific polysaccharide antigen. The immunization procedure of Lancefield et al. (5) was followed, using Formalin-killed Todd-Hewitt broth cultures. At the time of bleeding, antibodies to the group B antigen had usually disappeared.

The antiseras were examined by capillary precipitation and Ouchterlony tests, using hydrochloric acid extracts of the immunizing strains, of strains representing types Ia, Ib, II, III, and also of strains containing the Ibc, R, and X protein antigens. Antibody titers were measured after dilution with preimmune sera.

All three immunizing strains gave rise to type-specific antiseras with titers between 8 and 32. Because pepsin treatment of the hydrochloric acid extracts of the homologous strains did not affect the lines of precipitation seen in the Ouchterlony test, the type antigens most likely were polysaccharides. No cross-reacting antibodies were found in the three antiseras, neither against the two other immunizing strains nor against strains possessing the previously described type antigens. The strain-specific antiserum (NT 6) of Wilkinson also did not react with extracts of the strains used by us for immunization.

Extracts of 78 NT group B streptococcal strains were examined in capillary precipitation tests with the three antiseras (Table 1). One antiserum reacted with slightly less than 20% of the strains. Of the remaining 58 NT strains, 44 might very well be devoid of demonstrable type-specific polysaccharide antigens, because they did not grow with even turbidity in broth, had a rough appearance in semisolid agar, and showed a pronounced agglutination in a specific group B antiserum.

We did not systematically look for the protein antigens Ibc, R, and X in our NT strains. Antigen Ibc, however, proved to be present in three of the strains which were precipitated by antiserum to strain 12351 and in one of the strains precipitated by antiserum to strain SS 1169, because these strains exhibited lines of identity with the Ibc antigen in the Ouchterlony test.

The prevalence of strains of group B streptococci that do not possess any of the known type-specific polysaccharide antigens (i.e., Ia, Ib, II, and III) evidently varies with time and area. It was found to be about 6 and 11% in 1973 (3, 8), about 11 and less than 3% in 1977 in the United States (2, 6), approximately 10% in Denmark and Czechoslovakia (4), and 8% in the Netherlands (1).

Wilkinson found that less than 10% of her NT
strains reacted with her NT 1 antiserum and, therefore, concluded that this antiserum would be of little use in epidemiological studies. Less than 4% of our NT strains could be typed by the same antiserum, but nearly 20% reacted with an antiserum against our strain 12351. We will continue to use this antiserum for typing purposes, and if future studies, perhaps also performed by others in other parts of the world, demonstrate its usefulness, the establishment of a new type (type IV) might have to be considered.

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LITERATURE CITED