Asymptomatic meningococcal urethritis
Possible protective value against gonococcal infection
by bacteriocin production

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Neisseria species other than N. gonorrhoeae have been reported to cause symptomatic urethritis in
the male. Carpenter and Charles (1942) described seven such cases due to the meningococcus in which
there were no signs or symptoms of meningococcaemia. Although several authors have described
asymptomatic urethral carriers of N. gonorrhoeae (Bittiner and Horne, 1955; Landman and Gelmi,
1959; Pariser, Farmer, and Marino, 1964), there have been no reports of asymptomatic urethral infections
by other Neisseria.

We believe this to be the first report of asymptomatic meningococcal urethritis. The strain isolated
from this patient is the first meningococcus reported to produce a bacteriocin with antigenococcal activity.
Evidence is presented for the possible role of this bacteriocin in providing protection against gonococcal
urethritis in vivo.

Case reports

Case 1, a 20-year-old white man, who had had sexual intercourse once 3 weeks previously, was diagnosed as
having acute gonorrhoea on April 19, 1972. His only sexual contact was Case 2.

Case 2, a 20-year-old white female, was examined 7 days later, along with her regular consort (Case 3).
Cervical cultures yielded oxidase-positive Gram-negative diplococci. These organisms were identified as gonococci
by their utilization of glucose, but not maltose, sucrose, or lactose.

Case 3, a 20-year-old white male, was asymptomatic and showed no evidence of urethral exudate, but a
culture from the urethral meatus grew oxidase-positive, Gram-negative diplococci which utilized both glucose
and maltose. Bacterial agglutination performed by our

Special Bacteriology Laboratory identified these as sero-Group B meningococci. This patient was recalled
to the clinic 5 days after the initial examination, and although he continued to deny any symptoms, a slight
urethral exudate was expressed by vigorously stripping the penis. Microscopic examination of this exudate
showed a few polymorphonuclear leucocytes and several Gram-negative diplococci which were primarily associated
with epithelial cells. Cultures obtained at this time again showed oxidase-positive, Gram-negative diplococci which
had the typical oxidative pattern of meningococci.

Cultures frozen for subsequent investigations were successfully subcultured 6 weeks later. When standard
techniques for the demonstration of bacteriocin production were used (Fredericq, 1957), the N. meningitidis
strain from Case 3 showed marked growth inhibition of the N. gonorrhoeae strain from Case 2.

Discussion

The origin of the meningococcal infection in Case 3 is uncertain. Harkness (1950) believed that most
cases of urethritis caused by non-gonococcal Neisseria were transmitted from the nasopharynx of
the female to the male genital tract by oro-genital contact. It is significant that the patients in the
present study admitted frequent use of this sexual practice.

Although oral contact with male genitalia is a common sexual practice (Kinsey, 1953), Neisseria
other than the gonococcus have rarely been isolated from the urethra. The case described above is only
the eighth instance of meningococcal urethritis reported and this is the first report of the condition
being asymptomatic.

Bacteriocins are antibacterial substances of a protein nature that are produced by a wide variety
of bacteria and act on bacteria of the same or related species (Fredericq, 1957). Kingsbury (1966) has
shown that some N. meningitidis strains produce
bacteriocins which have an effect in vitro on other Neisseria species—N. perflava, N. subflava, and N. flavescens. The meningococcal strain recovered from the patient presented here (Case 3) is the first to be reported which produces a bacteriocin with activity against N. gonorrhoeae.

Epidemiological evidence has shown that a single exposure to an infected female does not invariably lead to gonorrhoea in the male (Holmes, Johnson, and Trostle, 1970). However, it is unusual for regular consorts to be spared if either partner contracts the disease. Cases 2 and 3 admitted having intercourse five to six times per week during a 4-week period in which Case 2 was known to be infectious. Because a condom or other protective device was not used, we postulate that the urethral meningococci and resultant antigonococcal bacteriocin of Case 3 may have offered protection against gonococcal infection from Case 2.

Summary

Inhibition of N. gonorrhoeae in vitro by a meningococcal bacteriocin is described. The meningococcus was isolated from the urethra of an asymptomatic male who, despite frequent coitus with a woman who had cervical gonorrhoea, did not develop gonococcal urethritis. The hypothesis is presented that the meningococcus may have prevented gonococcal infection by production of the antgonococcal bacteriocin in vivo.

References

LANDMAN, G. S., and GELMI, O. (1959) Sth. med. J. (Bgham, Ala.), 52, 750
PARISER, H., FARMER, A. D., and MARINO, A. F. (1964) Ibid., 57, 688

Urétérite méningococcique asymptomatique. Valeur protectrice possible de la production de bactériocine contre l’infection gonococcique

SOMMAIRE

On décrit l’inhibition in vitro de N. gonorrhoeae par une bactériocine méningococcique. Le méningocoque avait été isolé de l’urètre asymptomatique d’un homme qui, malgré de fréquents coïts avec une femme atteinte de gonococcie cervicale, n’avait pas présenté d’urétérite gonococcique. On évoque l’hypothèse que le méningocoque puisse avoir empêché l’infection gonococcique grâce à la production in vivo de bactériocine anti-gonococcique.