

Vancomycin-sensitive strains of *Neisseria gonorrhoeae* *A problem for the diagnostic laboratory*

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The diagnosis of *N. gonorrhoeae* infections depends upon the demonstration of the bacterium, and this is commonly done by cultivation. The laboratory diagnosis of *N. gonorrhoeae* was greatly facilitated by the introduction of the Thayer-Martin selective medium containing vancomycin, colistin and nystatin in its present formula (Thayer and Martin, 1966). An alternative combination of antimicrobial drugs in the selective medium, consisting of lincomycin and colistin, was proposed by Berger (1966) and Potuznik and Hausner (1969).

In the bacteriological laboratory of the City of Göteborg, Sweden, about 150,000 specimens are processed each year for the cultivation of *N. gonorrhoeae*. This laboratory uses a modification of the Thayer-Martin medium without the addition of nystatin.

Vancomycin, included in the Thayer-Martin combination of antibiotics, has been shown to inhibit the growth of certain gonococcal strains (Reyn, 1969; Cross, Hoger, Neibaur, Pasternack, and Brady, 1971). This initiated a study to investigate how common these strains were in Göteborg, and its environs, and whether they could be isolated on another medium suitable for routine use.

Material and methods

In October and November, 1972, a preliminary study was performed on 254 samples from 145 selected patients. The samples were cultivated both on the standard plate containing colistin and vancomycin and on the same plate without antibiotics. Samples were taken with charcoal-treated swabs and transported in a modified Stuart's medium. The plates were inoculated, the inhibitory plate first, and incubated for 40 hrs at 36°C.; gonococci were identified by their colonial and microscopic appearance, oxidase reaction, and fermentation tests.

Later, a second study was performed on 1,418 samples from 609 non-selected patients. In this study urethral, cervical, and rectal swabs were obtained from the female

patients and urethral swabs from the male patients. The swabs were transported in the modified Stuart's medium to the laboratory where they were transferred to 2 ml. broth and shaken for 20 sec. 0.1 ml. of this broth was inoculated on to the two following media:

(1) *CV-medium*, containing colistinmethanosulphonate 7.5 µg./ml. and vancomycin 3 µg./ml.

(2) *CL-medium*, containing colistinmethanosulphonate 7.5 µg./ml. and lincomycin 4 µg./ml.

The sensitivity of the isolated gonococcal strains to vancomycin and lincomycin was tested by plating them on solid media containing different concentrations of these antibiotics.

Results

The preliminary study showed that about 10 per cent. of the strains isolated from the selected group of patients were sensitive to vancomycin.

In the second study the number of samples growing gonococci on the various media is shown in Table I.

TABLE I *Number of samples growing (+) gonococci or not (-) on modified Thayer-Martin medium (CV) and colistin-lincomycin containing medium (CL)*

Medium		No. of samples
CV	CL	
+	+	83
+	-	3
-	+	12

The number of patients from whom gonococci were isolated on the various media is shown in Table II.

Contaminating bacteria were found to be inhibited to about the same extent on both the CV-plate and the CL-plate.

The eight strains isolated on the CL-medium but not on the parallel CV-medium did not grow in the presence of 1.25 µg. vancomycin/ml. All

TABLE II *Number of patients with bacteriologically diagnosed gonorrhoea on CV-medium and CL-medium*

Medium		No. of patients
CV	CL	
+	+	60
+	-	2
-	+	8

strains isolated in the study grew on a solid medium containing 5 µg. lincomycin/ml., but the growth of some of the vancomycin-sensitive strains was somewhat inhibited by this concentration.

Discussion

The present findings indicate that a relatively large proportion of the gonococcal strains encountered in Göteborg and its environs fail to grow on the Thayer-Martin medium because of the inhibitory action of vancomycin on these strains.

In the present study, the substitution of lincomycin for vancomycin resulted in a net gain of bacteriologically diagnosed cases of gonorrhoea of about 10 per cent. Gonococci sensitive to vancomycin are known to be more sensitive to other antibiotics (Reyn, 1969). All strains of *N. gonorrhoeae* isolated in this study grew on a medium containing 4 µg. lincomycin/ml., but it was observed that some of the vancomycin-sensitive strains were more sensitive to 5 µg. lincomycin than the vancomycin-resistant strains. Furthermore, the use of 4 µg. lincomycin/ml. in the selective medium was sufficient to suppress contaminant growth. At present there seems to be no reason to incorporate higher concentrations of lincomycin in the selective medium.

The incorporation of antibiotics in the media designed for the isolation of gonococci has been a great advantage, but gonococcal strains with an increased sensitivity to the inhibitors in the selective media present a problem of which the diagnostic laboratory should be constantly aware.

Summary

A relatively large proportion of the gonococcal strains isolated at the bacteriological laboratory of the City of Göteborg, Sweden, are sensitive to vancomycin. Substituting lincomycin for vancomycin in the medium used for isolation of gonococci resulted in a net gain of about 10 per cent. of bacteriologically diagnosed cases of gonorrhoea.

References

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Les souches de *Neisseria gonorrhoeae* sensibles à la vancomycine, un problème pour le diagnostic de laboratoire

SOMMAIRE

Une proportion relativement importante de souches de gonocoques isolées au laboratoire de bactériologie de la ville de Göteborg (Suède) sont sensibles à la vancomycine. En remplaçant la vancomycine par la lincomycine dans le milieu d'isolement, on obtint un gain net de 10 pour cent dans le diagnostic bactériologique des cas de gonococcie.