Patterns of carriage of group B streptococci in genitourinary medicine clinic patients

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SUMMARY Anogenital carriage of group B streptococci was found in 46% (57/125) of men and 38% (68/179) of women attending a genitourinary medicine clinic. Colonisation with group B streptococci was more common in patients who had a history of more than one sexual partner in the preceding three months, but was not related to any previous sexually transmitted infection. Group B streptococci were isolated from either one or both partners of 28 couples, in 12 of which both partners yielded isolates that were indistinguishable by serotyping and phage typing. Colonisation with matching isolates of group B streptococci was more common in couples who had relatively stable relationships.

Group B β haemolytic streptococci are important pathogens in the neonatal period.1 Although babies normally acquire the organisms from the maternal genital tract during delivery, nosocomial transmission of group B streptococci has also been shown.2 Other epidemiological aspects of group B streptococci are less clear. In adults asymptomatic anogenital carriage is common, which suggests that sexual contact may be an important mode of transmission, and there is some evidence to support this view. Patients attending sexually transmitted diseases (STD) clinics have been shown to yield group B streptococci more often than other study populations.34 In a study of group B streptococci colonisation of female students, Baker et al isolated the organism significantly more often from those who were sexually active than from those with no history of sexual contact.5 Attempts to correlate the incidence of group B streptococci with promiscuity, however, have been unsuccessful.6

The introduction of a phage typing scheme for group B streptococci has facilitated the study of their transmission. Phage typing has helped document several instances of nosocomially acquired group B streptococcal infection in neonatal units78 and has been used to show carriage of identical isolates in members of the same family.9 Using both serotyping and phage typing, however, Jackson et al found little evidence for sexual transmission of group B streptococci in an STD clinic population.10 The present study investigated the incidence and transmission of group B streptococci in patients attending a genitourinary medicine clinic. Several clinical and demographic characteristics were recorded to identify factors that might influence the carriage and transmission of the organism.

Patients, materials, and methods

We investigated 125 men and 179 women who attended the department of genitourinary medicine of the Royal Hallamshire Hospital as new patients or re-attenders. All patients underwent routine investigations for STD. In addition separate plain cotton tipped swabs were used to take material from the urethras and rectums of men and from the urethras, rectums, and lower vaginas of women. Homosexual men were excluded from the survey. Couples were identified after analysing the clinic case notes. The χ² test was used for statistical analysis.

The cotton swabs from each site were placed in Todd-Hewitt broth (BBL) supplemented with defibrinated horse blood 5% v/v, nalidixic acid 15 μg/ml, and gentamicin sulphate 4 μg/ml. After overnight incubation at 37°C, the resulting broth culture was subcultured on to Columbia blood agar (Oxoid) and
Islam's starch serum agar. Plates were incubated anaerobically overnight at 37°C, and colonies of group B streptococci were identified by haemolysis on blood agar and characteristic orange pigmentation on Islam's medium. Group B streptococcal isolates were stored on blood agar slopes at 4°C. Serotyping and phage typing was performed at the Streptococcus Reference Laboratory, Colindale.

Results

CARRIAGE OF GROUP B STREPTOCOCCI

Of the 125 men patients tested, 57 (46%) yielded cultures of group B streptococci (table 1). Carriage of group B streptococci was not associated with any particular age, the isolation of gonococci, or a history of STD, but significantly (p < 0.001) more men had a history of more than one sexual partner during the preceding three months. The incidence of group B streptococci from urethras and rectums was identical, and cultures from both sites identified 77% (44) of the total number of colonised patients (data not shown).

Group B streptococci were found in cultures from 68 (38%) of the 179 women tested. Again colonisation was not associated with any of the epidemiological variables investigated apart from a recent history of

Table 2  Serotypes and phage types in couples with both partners colonised with group B streptococci

*Weak reaction.
Two men (couples 8 and 11) and one woman (couple 5) were colonised with two strains of group B streptococci.
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Table 3 Lengths of relationships of 28 couples yielding group B streptococci

<table>
<thead>
<tr>
<th>Length of relationship</th>
<th>No of couples in which:</th>
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<tbody>
<tr>
<td></td>
<td>Both partners colonised with identical strains (n = 12)</td>
</tr>
<tr>
<td>&lt;1 month</td>
<td>0</td>
</tr>
<tr>
<td>1-6 months</td>
<td>2</td>
</tr>
<tr>
<td>&gt;6 months</td>
<td>10</td>
</tr>
</tbody>
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more than one sexual partner (p < 0.01). Cultures from rectums, vaginas, and urethras identified 82.3% (56), 77.9% (53), and 70.6% (48) respectively of the culture positive women (data not shown).

**TRANSMISSION OF GROUP B STREPTOCOCCI**

We identified 47 couples in the study population. In 19 instances neither partner was colonised with group B streptococci, and in a further 12 couples only one partner was colonised. Of the 16 couples in whom both partners were carrying group B streptococci, 12 yielded isolates that were indistinguishable by serotyping and phage typing (table 2). Thus of the 28 couples yielding group B streptococci from at least one partner, 12 showed evidence of sexual transmission. Eleven of those 12 couples had been sexual partners for at least six months, compared with only six out of 16 couples in whom evidence of sexual transmission of group B streptococci was not apparent (table 3).

**Discussion**

Considerable attention has been focused on group B streptococci colonising the genital tracts of women, particularly in antenatal patients. Reported incidences have varied widely, but this has largely been because of differences in sampling sites and the omission of enrichment techniques in early studies. Colonisation with group B streptococci has, however, been found to be appreciably more common in patients attending STD clinics, and the incidence of 37% in women attending our own clinic was similar. Epidemiological studies of the carriage of group B streptococci in male populations have been reported less often. Our isolation rate of 46% in men was higher than that of 37.9% quoted by Jackson et al, who also studied STD clinic patients.

Interestingly, the incidence of group B streptococci was significantly greater in men and women who gave a history of more than one sexual partner during the preceding three months, which added weight to the argument that the higher incidences of group B streptococci in STD clinic populations are related to an increased number of sexual contacts. Indeed, the greater incidence in men than women in our study was because more men gave a history of multiple sexual partners (34/125 compared with 22/179 women, table 1). We found no association, however, between the carriage of group B streptococci and either a history of STD or, as reported by others, a diagnosis of gonorrhoea. As only five of the 125 men studied had a diagnosis of non-specific balanitis, we cannot comment on the possible aetiological role of group B streptococci in that condition.

Evidence has accumulated that the rectum is the primary site of colonisation with group B streptococci in adult populations. Studies of infants and teenagers indicate that perineal carriage of group B streptococci is established early in life. Although over 80% of women in the present study showed rectal colonisation, carriage of the organism in the vagina and urethra was almost as common.

In men in this study, rectal and urethral incidences were equal. These figures did not differ appreciably from those of other workers and suggested that general perineal contamination or colonisation is common. Given this, it would be surprising if sexual transmission did not occur. Evidence for stable carriage of the same group B streptococcal strain in sexual partners, however, is inconsistent. A study of group B streptococcal colonisation in the families of colonised babies in West Berkshire showed that about half the husbands of colonised mothers were carrying group B streptococci and that the isolate invariably had the same serotype and phage type. In contrast, Jackson et al, who also used a combination of serotyping and phage typing, found little evidence of transmission between sexual partners attending an STD clinic; only three out of 56 couples (with one or both partners carrying group B streptococci) were colonised with organisms of a matching type. The clinic populations of that study did not differ obviously from those of our own, in which evidence of sexual transmission was found in almost half the couples investigated. Jackson et al found no link between the stability of the relationships and carriage of the same group B streptococci isolate, but provided no figures. Our observation of a positive correlation between colonisation with the same strain of group B streptococci and a relatively stable relationship appears at first glance to contradict the finding of higher incidences in promiscuous patients. In promiscuous patients, however, the acquisition of group B streptococci from a colonised sexual partner is presumably often only temporary, and more regular sexual contact would be required to establish stable carriage.
References

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E F Monteiro, K M Oxley, G Colman and J G Hastings

doi: 10.1136/sti.64.6.387

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