Screening for sexually transmitted infections in pregnancy at Middlemore Hospital, 2009

Alec J Ekeroma, Leena Pandit, Cecilia Bartley, Bettina Ikenasio-Thorpe, John M D Thompson

Abstract

Aims To determine the screening rate for, and the prevalence rate of, sexually transmitted infections (STIs) in pregnancy at Middlemore Hospital.

Method A list of all 6795 women who had a baby at Middlemore Hospital in 2009 was provided by the hospital’s information systems. Details of the women including their swab results were then obtained from the Healthware and Web-Éclair databases. Comparison of screening and STI rates by categorical variables (Lead Maternity Carer (LMC), age group and ethnicity) was carried out using Chi-square statistics. Univariable and multivariable odds ratios were estimated using unconditional logistic regression.

Results Only 4635 (64.3%) of women were screened in pregnancy for an STI. There was a significant difference in rates of testing by LMCs, with independent maternity providers less likely to carry out a swab than the District Health Board (DHB) providers (71.3% vs 54.0%, p<0.0001). A higher proportion of Māori and Pacific women were screened compared to other groups and younger women were screened more compared to older women. Of those women screened, 8.2% had chlamydia, 2.2% had trichomonas and 0.2% had gonorrhoea. There were higher rates of chlamydia and trichomonas seen in both Māori and Pacific women in comparison to European and Asian women. There was a pattern of decreasing STI rate with an increase in maternal age.

Conclusion Screening for STIs in pregnancy in Middlemore Hospital is low and does not meet the requirements of the Ministry of Health which requires all women to be screened. The STI prevalence rate is high especially in young Pacific and Māori women. Education of both women and maternity providers is important in prevention and detection of STIs in pregnancy.

A sexually transmitted infection (STI) in pregnancy can lead to preterm labour, premature rupture of membranes, stillbirths, small for gestational age births, amnionitis, intrapartum fever, postpartum endometritis, as well as vertical transmission causing neonatal conjunctivitis, neonatal pneumonitis and perinatal mortality.1-4

Chlamydial infection of the urogenital tract is the commonest STI and a significant health problem in New Zealand due to its high prevalence rate of up to 12%, the relative lack of symptoms, and infected women may acquire complications that may persist throughout their lifetime. There have been calls for routine testing in pregnancy since Lawton et al6 found a chlamydial prevalence rate of 4.8% in the
Wellington area and Rose et al\textsuperscript{7} found an STI rate of 10\% in women presenting for termination of pregnancy.

Instead of a screening programme, the Ministry of Health (MOH) encouraged STI screening in pregnancy especially for Māori and Pacific women and those under 25 years of age.\textsuperscript{8}

Middlemore Hospital (MMH) of the Counties Manukau District Health Board (CMDHB) delivered 6795 babies in 2009 and about 57\% of the women are of Māori or Pacific ethnicity. Of the Māori and Pacific women, approximately 50\% and 80\% respectively, reside in NZDep2006 9 and 10 areas.\textsuperscript{9}

About 55\% of all women had CMDHB staff as their lead care provider whilst private providers, who were exclusively self-employed midwives, cared for the remaining 45\%. The CMDHB guidelines\textsuperscript{10} recommends that “all women under the age of 25 should be offered testing when they access healthcare, in particular when attending for sexual health related issues such as pregnancy.”

There is a paucity of STI prevalence studies in pregnancy in New Zealand and it is uncertain whether maternity providers are adhering to the MOH and local facility guidelines.

The aim of this study is to determine the screening rate for STIs in pregnancy and to determine the STI rate in pregnancy in an area that has the highest number of Māori, Pacific and young people in the country.

Materials and Methods

A list of all 6795 women who had a delivery at MMH in 2009 was provided by Middlemore Hospital’s information support personnel. The list, which was generated from the Patient Information Management System (PIMS), had the details of the woman’s National Health Index (NHI) number, age, ethnicity and LMC. These details were cross-checked with the data on the Healthware database using the NHIs as the identifiers. The women’s NHIs were then again used to individually search for their swab results on the Web-Éclair database. There may have been a small number of results that were not entered into the computer system at the patient’s request.

All data was entered into a Microsoft Excel 2003 spreadsheet. Comparison of swab rates and STI rates by categorical variables (LMC, age group and ethnicity) was carried out using Chi-square statistics. Univariable and multivariable odds ratios were estimated using unconditional logistic regression. All analyses were carried out in SAS 9.1 for windows and statistical significance was defined at the 5\% level.

An antenatal STI screen was defined as endocervical and vaginal swabs taken at any stage of the pregnancy and may include urethral swabs. Urine and blood tests for chlamydia have a poor sensitivity and specificity and were not considered appropriate for STI screening.

Approval from the Northern-X Regional Ethics Committee was obtained.

Results

Screening rate—Of the 6795 births in MMH in 2009, 4635 women (64.3\%) had screening for an STI during pregnancy. European women had the lowest rate of screening with 1381 (49.6\%) screened whereas 1380 (66.3\%) of Māori (OR 2.00) and 2919 (70.4\%) of Pacific (OR 2.41) women were screened (Table 1). Not all women had the full set of STI screening swabs.
Of the 4635 women tested, 3917 (82%) had chlamydia swabs, 3938 (85%) had trichomonas and 1529 (33%) had swabs for gonorrhoea. 52 women had a urine test for chlamydia and 7 of them were positive.
Table 1. Swab rates and STI infection rates by ethnicity

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Vaginal swab rate n (% tested)</th>
<th>Odds ratio</th>
<th>Chlamydia* Odds ratio</th>
<th>Trichomonas* Odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>1381 (49.6) Reference</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Māori</td>
<td>1380 (66.3) 2.00 (1.72–2.33)</td>
<td>907 (10.3%) 2.31 (1.53–3.50)</td>
<td>683 (0.4%) Reference</td>
<td>Reference Reference</td>
</tr>
<tr>
<td>Pacific</td>
<td>2919 (70.4) 2.41 (2.11–2.75)</td>
<td>2046 (10.7%) 2.41 (1.65–3.52)</td>
<td>2049 (3.1%) Reference</td>
<td>7.19 (2.25–22.97) Reference</td>
</tr>
<tr>
<td>Asian</td>
<td>377 (58.4) 1.42 (1.13–1.79)</td>
<td>215 (1.9%) 0.38 (0.13–1.10)</td>
<td>219 (0.5%) Reference</td>
<td>1.05 (0.11–10.10) Reference</td>
</tr>
<tr>
<td>Other</td>
<td>106 (67.9) 2.15 (1.41–3.28)</td>
<td>70 (0.1%) 0.60 (0.14–2.54)</td>
<td>72 (0.0%) Reference</td>
<td>undefined undefined</td>
</tr>
</tbody>
</table>

* Number of tests carried out and the percentage of these tests that were positive; ^ Mutivariable analyses control for LMC, ethnicity and maternal age group; “Other” includes all ethnicities who were not Asian, European, Pacific or Māori.

Table 2. Swab rates and STI infection rates by maternal age

<table>
<thead>
<tr>
<th>Age groups</th>
<th>Vaginal swab rate n (% tested)</th>
<th>Odds ratio</th>
<th>Chlamydia* Odds ratio</th>
<th>Trichomonas* Odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>670 (74.5%) 2.21 (1.79–2.72)</td>
<td>497 (21.7%) 21.69 (10.46–44.98)</td>
<td>499 (3.6%) 3.39 (1.40–8.18)</td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>1705 (71.2%) 1.87 (1.60–2.19)</td>
<td>1209 (12.7%) 11.32 (5.52–23.02)</td>
<td>1212 (2.5%) 2.30 (1.00–5.26)</td>
<td></td>
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<tr>
<td>25-29</td>
<td>1816 (62.7%) 1.27 (1.09,1.48)</td>
<td>1128 (5.5%) 4.54 (2.16–9.55)</td>
<td>1133 (2.6%) 2.38 (1.04–5.46)</td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>1470 (59.5%) 1.11 (0.95–1.30)</td>
<td>867 (3.0%) 2.42 (1.09–5.37)</td>
<td>868 (1.2%) 1.06 (0.40–2.79)</td>
<td></td>
</tr>
<tr>
<td>35+</td>
<td>1124 (56.9%) Reference</td>
<td>633 (1.3%) Reference</td>
<td>641 (1.1%) Reference</td>
<td></td>
</tr>
</tbody>
</table>

Linear test for trend p<0.0001 p<0.0001 Reference Reference Reference Reference Reference Reference Reference

* Number of tests carried out and the percentage of these tests that were positive; ^ Mutivariable analyses control for LMC, ethnicity and maternal age group.
STI screening by age group showed a pattern with less screening with advancing age. 670 (74.5%) of women less than 20 years of age were screened compared with 1124 (56.9%) of women 35 years of age and older (p<0.0001).

Private maternity providers were less likely to perform screening compared to CMDHB providers (54.0% vs 71.3%, p<0.0001).

**Infection rate**—Chlamydia was the commonest STI in pregnancy. Of the 4635 women who had screening, 357 (8.2%) were positive for chlamydia, 94 (2.2%) for trichomonas, and 10 (0.2%) for gonorrhoea.

STI in pregnancy was lowest in women of Asian (1.9%) and European (4.7%) ethnicity and highest in Māori 93 (10.3%) and Pacific 219 (10.7%) women (Table 1). The multivariable odds ratio showed Pacific women had a 2.15-fold increased risk and Māori a 1.61-fold increased risk of an STI compared to European women. *Trichomonas* infection was also higher in Māori (3.0%) and Pacific (3.1%) women compared to European (0.4%) and Other (0.0%).

Chlamydial infection was highest in younger women compared to older women. 497 (21.7%) of women less than 20 years of age had chlamydial infection compared to 633 (1.3%) women 35 years and older with positive swabs. Women under 20 years of age had a 23-fold increased chance of having a chlamydial infection compared to a 35-year-old woman (Table 2). There was a decreasing rate of both chlamydia and trichomonas as age decreased, the increasing risk with younger maternal age remained significant in multivariable analyses but was not of the same magnitude as for trichomonas.

Where chlamydia or trichomonas was present, there was a 6.73 (95%CI=4.23–10.68)-fold increased chance that the other STI was present.

Rate of chlamydial infection was lower in women cared for by a private provider (2.1%) compared to a CMDHB provider (6.1%).

**Discussion**

The MOH 2008 Chlamydia Management Guidelines advise routine testing in pregnancy “as there is a 20-50% risk of neonatal transmission in women with untreated chlamydial infection”. The words *screening or programme* were not used following a report to the National Screening Unit despite calls for routine screening after two research papers found high chlamydial rates in women presenting for terminations of pregnancy and in pregnancy.

Studies in STI prevalence rates in pregnancy have been lacking although a few studies have identified high risk groups in the less than 20 years of age, Māori and Pacific women. There has equally been a lack of studies to determine whether care providers were compliant with the MOH guidelines and offering women STI testing in pregnancy.

Our study has shown that only 64% of women had STI screening in pregnancy and not all of them had the recommended set of three swabs to exclude chlamydial, trichomonal and gonorrhoeal infection. Of serious concern is the low screening rate for gonorrhoea with only 23% of all the 6795 women screened. Swabs for chlamydia and gonococcus are taken from the endocervix so it is uncertain as to why the
screening rate for the former was 2.5 times higher than the latter unless providers had decided not to screen for gonorrhoea in 49% of women who had chlamydial swabs.

It was encouraging to note that women under 20 years of age had more STI screening (75%, 2.2-fold) compared to women 35 years and older (60%). Maternity providers were obviously aware that younger women were more at risk. However, the shortfall in testing is of concern with 1 in 4 young women not being tested. Extrapolating from the chlamydial infection rate in our study for women under 20 years of age, approximately 36 women with chlamydia would have been missed and untreated.

Pacific, Other and Māori women had higher screening rates compared to European and Asian women, which may mean that the clinical practice of maternity providers had taken into account the importance of screening women from ethnicities with a high risk of an STI. There is a concern however that 30% of Pacific women and 34% of Māori women were not tested which was a significant number of untested women. Taking into account the chlamydial infection rate in our study for Pacific and Māori women, there would have been approximately 143 women in 2009 with chlamydia that was untreated.

Chlamydia is a treatable infection and the resultant morbidity of untreated chlamydia is totally preventable. The screening rate for STI in pregnancy fell short of the MOH guidelines and although it was higher than the screening rate of 37.5% in Wellington, this should be expected as the MOH guidelines were published in 2008.

Of interest was the finding that private providers performed fewer tests compared to CMDHB providers and this difference was statistically significantly. A study is needed to determine the factors behind this variation in practice between private and public providers. It may be that a higher number of the women booked with private providers were not interested in being tested (different population characteristics) compared to women cared for by the public system. It has been shown that women found testing acceptable. It may also be that the private providers had decided that most of their clientele were low risk and therefore did not need to be tested.

The latter is probably a safer assumption as the rate of chlamydial infection in women cared for by the private providers (2.1%) was lower than those cared for by the public system (6.1%). This can be explained by the fact that more Pacific and Māori women, or women at high risk of having an STI in pregnancy, are cared for by the public system, with lower risk women choosing private carers (CMDHB data).

Chlamydia was the commonest STI in pregnancy with a prevalence of 8.2%, which confirmed findings from New Zealand studies, that chlamydia remains a significant disease burden. The infection rate was higher than that found in the Wellington study which can be explained by the higher proportion of Māori and Pacific women and women less than 20 years of age resident in the CMDHB area compared to the Wellington area.

The trichomonas rate was also higher in both Māori and Pacific women in comparison to European women, stressing the importance of testing for all STIs especially in the high risk groups. The presence of one STI increases the chances of another one being present.
The question of whether to universally screen in pregnancy remains a contentious one. The British National Health Service recommended targeted testing of at risk groups and the NICE guidelines recommended offering screening to women 25 years and younger. The guidelines were careful to state that the long-term complications of not testing in pregnancy were not considered. The Centre for Disease Control and Prevention in the USA in 2010 recommended routine testing for chlamydia in pregnancy.

The strength of our study was the large number of women in an area with high socio-economic deprivation and the weakness was the inability to estimate the number of women who may have opted out of sharing their laboratory results.

Due to the significant under-testing found in our study, we recommend that the MOH enforce adherence to STI testing guidelines especially for Māori, Pacific and those less than 25 years of age.

Variations in testing uptake and rates should be urgently addressed through awareness programmes and professional guidelines in collaboration with DHBs.

Competing interests: None.

Author information

Alec J Ekeroma, Senior Lecturer; Leena Pandit, Elective Medical Student; Cecilia Bartley, WHO Fellow; Bettina Ikenasio-Thorpe, Research Fellow; John M D Thompson, Epidemiologist/Statistician

1. Pacific Women’s Health Research & Development Unit, Department of Obstetrics and Gynaecology, University of Auckland, Middlemore Hospital, Auckland.
2. University of Aberdeen, Scotland
3. Department of Paediatrics: Child and Youth Health, University of Auckland, ACH Support Building, Park Road, Grafton, Auckland 1020

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Correspondence: Alec Ekeroma, University of Auckland, Middlemore Hospital, Private Bag 93311, Auckland, New Zealand. Fax: +64 (0)9 5235253; email: Alec.Ekeroma@middlemore.co.nz

References:


