Factors affecting women’s preference for type of prenatal screening test for chromosomal anomalies

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ABSTRACT

Objective To ascertain, by means of a questionnaire, women’s preferences for four different approaches to prenatal screening for Down syndrome.

Methods Women attending antenatal clinics at six UK maternity units were asked to put in order of preference four different approaches to screening for Down syndrome all of which had the same false positive rate of 5%. The options were: (1) first-trimester testing, 90% detection of Down syndrome with results available in 1 h at one-stop clinics for the assessment of risk (OSCAR); (2) first-trimester testing, 90% detection and results available within 2–3 days (combined screening); (3) first-trimester testing plus second-trimester testing, 93% detection and results available within 2–3 days of second test (integrated testing); (4) second-trimester testing, 75% detection and results available within 2–3 days.

Results Over 1100 women attending antenatal clinics at six maternity units across the UK returned the questionnaire. A total of 75% of women selected a first-trimester test (option 1 or option 2) as their first choice with 68.2% expressing a preference for the OSCAR approach and a further 6.8% for combined screening. Twenty-four percent of women opted for integrated testing as their first choice with only 1% expressing a preference for second-trimester screening.

Conclusions A first-trimester test is preferred by the majority of women over a test with marginally higher detection rate that delivers results later in pregnancy. Timing and rapid reporting of results appear to influence women’s choice of test. Copyright © 2004 ISUOG. Published by John Wiley & Sons, Ltd.

INTRODUCTION

The policy and practice of prenatal screening for chromosomal anomalies is changing rapidly1. This has created a growing complexity in the choice of screening methods which is confusing to both patients and practitioners. In Europe in particular, there is a significant shift from conventional second-trimester screening using maternal serum biochemical markers, to a policy of first-trimester screening using a combination of nuchal translucency (NT) measured ultrasonographically in combination with the first-trimester maternal serum biochemical markers free beta human chorionic gonadotropin (β-hCG) and pregnancy-associated plasma protein-A (PAPP-A). In contrast to the approach still used frequently in the USA, offering women an invasive diagnostic test based on advanced maternal age has been superseded long ago by the introduction of second-trimester biochemical screening.

Screening in the first trimester can be delivered either as a Point of Care service2, as provided in the one-stop clinics for the assessment of risk (OSCAR)3–6, or it may be provided in a concurrent way by either performing the biochemical testing prior to the NT ultrasound examination or, more commonly, by performing the biochemical testing after the NT ultrasound examination7. A further form of screening has been proposed in which women have a biochemical screening test and an ultrasound examination at 11 weeks, receive no results and are then recalled for further biochemical screening at 16–18 weeks and a combined risk estimate is produced using all of the first-trimester and second-trimester information8. Such screening, referred to as the ‘Integrated Test’, has been shown by statistical modeling to have a higher detection rate when compared at an equivalent false positive rate with prospective data from first-trimester combined screening programs5,6.

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However, a major uncertainty over integrated testing is women’s attitudes to the non-disclosure of results after the first-trimester component of screening has been completed. It has been suggested that medical staff will come under pressure from women anxious to know their NT measurement as soon as possible and this provision of interim results will effectively undermine the theoretical gains in detection which integrated testing may offer.

We have attempted to assess women’s attitudes towards the delay inherent in the provision of results from integrated testing through a simple questionnaire distributed amongst women attending antenatal clinics in a number of centers across the UK offering different types of prenatal screening tests.

**METHODS**

A simple prenatal screening options questionnaire was constructed, which described briefly the four main options for prenatal screening in terms of time performed, when results would be available and the detection rate at the same fixed false positive rate (5%). The responders were asked to state their age and to identify in preference order the various alternative options. The questionnaire was constructed in a simple way so that, in the confines of a busy antenatal clinic, a reasonable response rate could be achieved in a short space of time with little staff intervention. We provided information on test sensitivity and specificity since it was felt that information such as positive predictive value of a test would be a more complex concept and may have required staff intervention to explain, which may have biased the results. In each of the units, the questionnaire was completed at the prenatal screening visit. Thus, for those centers offering first-trimester screening this was at 11–13 weeks and for those offering second-trimester screening this was at 15–18 weeks. The questionnaire was filled out primarily by the women being screened although at some centers a contribution may have been made by their partners. Figure 1 shows the final questionnaire used in all sites.

A total of six sites, with differing existing screening programs, were enlisted and women attending the antenatal clinic for their routine prenatal screening test were asked to complete and return the questionnaire before leaving the clinic. Three sites were in Scotland, in which the form of screening offered was conventional two-marker second-trimester biochemical screening. For analysis purposes these three centers were combined and identified as Center A, where some 5460 women per year have been screened. The remaining sites were located in the southeast of England. One site was a university teaching hospital offering conventional two-marker second-trimester biochemical screening and was identified as Center B, which has screened some 2500 women per year. Another site was a large district general hospital offering first-trimester screening using ultrasound and first-trimester maternal serum biochemistry with the results provided to the patients within a 3–4 day period after the test. This center screened some 3500 women per year and was identified as Center C. The fourth site was also a large district general hospital offering first-trimester screening using ultrasound and first-trimester maternal serum biochemistry in an OSCAR clinic with results provided within a 1-h visit. This center was identified as Center D and screened some 4500 women per year.

Analysis of the questionnaire returns were made based on overall preference, preference related to maternal age band and preference related to the screening policy (and hence time of screening) operational on the site under investigation.

**RESULTS**

Completed questionnaires were returned by a total of 1127 women. The number of responses and the median and range of maternal ages from the responders are shown in Table 1.

Figure 2a shows the overall options chosen by all responders. For the first choice option the OSCAR approach was the choice made by 68% of women, and
overall, 75% of women chose a first-trimester screening option compared to 24% who would have chosen an ‘Integrated Test’ option and 1% who would have opted for second-trimester screening as their first option.

When the second choice was examined (Figure 2b) 47% of women preferred the delayed first-trimester option with again 71% preferring a first-trimester screening option in preference to an ‘Integrated Test’ option (27%) and 2% who would have opted for second-trimester screening.

When the third choice was examined (Figure 2c) a very similar proportion of women chose either an ‘Integrated Test’ option (47%) or a first-trimester screening option (51%), whilst 3% would have opted for second-trimester screening.

When the fourth choice option was examined (Figure 2d) clearly second-trimester screening was the option least favored by all women (94%).

These data show that when presented with a choice, 75% of women would prefer to have some form of first-trimester screening rather than second-trimester screening or an ‘Integrated Test’, despite indicating that the latter test had a better detection rate. Comparing responses to the first-trimester options (i.e. same day results from an OSCAR clinic or waiting 2–3 days for results from the standard combined screening approach) women were 10 times more likely to prefer the ‘instant’ results option.

When the data were analyzed by taking account of the prenatal screening service offered on site, for those offering second-trimester screening the preferred choice was 59.9% for first-trimester OSCAR, 10.6% for delayed first-trimester screening (70.5% for any form of first-trimester screening), 30.2% for ‘Integrated Test’ and 1.6% for what was currently offered, i.e. second-trimester screening.

On the site offering first-trimester screening with results within 2–3 days, again the preferred choice was 65.1% for first-trimester OSCAR, 12.8% for delayed first-trimester screening, i.e. what was currently offered (77.9% for any form of first-trimester screening), 25.6% for ‘Integrated Test’ and 1.2% for second-trimester screening.

On the site offering first-trimester screening in an OSCAR clinic, the preferred choice was again 77.7% for first-trimester OSCAR, 2.2% for delayed first-trimester screening (80% for any form of first-trimester screening), 19.8% for ‘Integrated Test’ and 0.2% for second-trimester screening.
The study by Kornman and second-trimester screening and neither have included to address the issue of women's preference between first trimester test if it had been available. This result is very similar to that 76% of women would have preferred a first-trimester screening option was very similar (70–80%) and did not appear dependent upon the method currently offered.

Maternal age was indicated in 1110 cases (98.5%). Table 2 shows the first choice options of women stratified by maternal age bands. Although there was a lower acceptance of OSCAR and a higher acceptance of ‘Integrated Test’ in women less than 20 years of age compared with women 35 years or over, such differences were not statistically significant using Chi-square tests. In all age groups the preferred choice would have been for first-trimester OSCAR screening by some 3:1.

These results indicate that the current screening program offered by the sites does not have an impact on the preferred choice, although as could be expected the greatest preference for the OSCAR approach was found on the site currently offering this service. However, overall the proportions of women selecting a first-trimester screening option was very similar (70–80%) and did not appear dependent upon the method currently offered.

DISCUSSION

Very little attempt has been made to elicit women’s opinions and views on different forms of prenatal screening delivery. Only two studies have appeared to address the issue of women's preference between first and second-trimester screening and neither have included the ‘Integrated Test’ option. The study by Kornman et al. canvassed opinion from 109 women attending an antenatal clinic for second-trimester screening and found that 76% of women would have preferred a first-trimester test if it had been available. This result is very similar to our findings that for 75% of women the preferred option was for a first-trimester test (68.19% for OSCAR and 6.83% for combined screening). In a short anecdotal report, 500 women at 6–10 weeks’ gestation were asked to complete a questionnaire to find out whether they preferred a first or second-trimester screening test. The first-trimester test was preferred by 496 women (99%). The reasons given for such a preference were earlier testing, prompt results and the possibility of a first-trimester therapeutic abortion in the event of an abnormal fetus. In the only other study to report on women’s knowledge of and attitudes to first-trimester screening, Mulvey and Wallace used a structured questionnaire to explore the attitudes and preferences of 100 women attending their first hospital antenatal visit to first and second-trimester screening. When given the choice of a first or second-trimester screening test 74% of women indicated a preference for first-trimester screening. These results are therefore very similar to the results of our much larger survey in which we have provided two different first-trimester options, a second-trimester option and an option spanning both first and second trimesters. Our results confirm that a first-trimester option is favored by the majority of women and is chosen in preference to a test that has a marginally higher detection rate but is delivered over a protracted time period. This may have important implications for the delivery of the integrated testing protocol. If women having integrated testing insist on disclosure of results immediately after completion of the first-trimester component of the test, the theoretical gains in sensitivity and specificity of the ‘Integrated Test’ will be compromised. Women given high-risk results at Stage 1 are likely to opt for diagnostic testing at that point, whilst others with a low risk may be reassured and default on the second stage of testing.

Unsurprisingly, our data show that the current standard of care in the UK – provision of second-trimester biochemical screening – is not favored by women when set alongside the first-trimester or integrated forms of testing. A major influencing factor is undoubtedly the availability of results from first-trimester screening at a much earlier stage of pregnancy. However, higher detection rates are also important. In our survey around one quarter of women would have opted for integrated testing and it is likely that this group value a test with a higher detection rate over one with lower detection, which provides an earlier result.

Our survey did not explore the impact that different false positive rates might have on women’s decisions regarding test type. We cannot discount the possibility that if detection rates were fixed at the same level for all tests and false-positive rates varied, women may show a preference for tests with the lowest follow-up rates. A recent study of women’s preferences for a test having either the lowest screen-positive rate or the highest detection rate, has shown that women over 37 years of age prefer a test with the highest detection rate. In our survey around one quarter of women would have opted for integrated testing and it is likely that this group value a test with a higher detection rate over one with lower detection, which provides an earlier result.

So what is the optimum screening policy? It can be argued that most women request prenatal screening because they wish to avoid having a child with Down syndrome and therefore high detection rates are important. There is evidence that women do not equate loss of a healthy fetus through procedure-related miscarriage with detection of an affected fetus. Others, however, undergo testing to seek reassurance that their pregnancy is at low risk of a fetal abnormality and for these women a test with maximized specificity is the best option. These considerations have to be balanced against the clear preference by women, illustrated in this study, for the provision of screening results at an early stage of pregnancy.

Table 2 First-choice screening options by maternal age band

<table>
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<tr>
<th>Age band (years)</th>
<th>n</th>
<th>Option 1 (%)</th>
<th>Option 2 (%)</th>
<th>Option 3 (%)</th>
<th>Option 4 (%)</th>
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