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Article

Biochemical screening for Down syndrome: patients' perception of risk

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Abstract

Objectives: To determine the utility of the triple test in routine clinical practice and in addition to the document, the acceptability of a cut-off of 1:250 for invasive testing. *Design:* Retrospective analysis of data from screening and invasive testing for Down syndrome over a 5-year period in Hull Maternity Hospital. Computer-based records were accessed and individual data drawn from case notes were analyzed. *Results:* 14 827 (78%) of all patients opted for the triple test. A positive result (1:250 or greater) was found in 586 (4%). Fifteen percent of this group refused further testing with amniocentesis. 0.08% requested amniocentesis despite a negative triple test result. Of the screened pregnancies the triple test and selective invasive testing identified nine out of 15 (60%) of Down syndrome cases. *Conclusion:* Sixty percent of Down syndrome pregnancies were identified with a 4% invasive testing rate. Fifteen percent of women who had a positive test did not agree with the cut-off of 1:250 and therefore declined invasive testing. Invasive procedure complication rates do not equate with patients' perception of Down syndrome.

Keywords: Prenatal screening; Down syndrome; Prenatal testing

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1. Introduction

Down syndrome occurs in 1/850 live births. Maternal age is the most important factor affecting the incidence, which is 1/1500 live births in a 20-year-old woman and 1/28 in a 45-year-old woman [1].

Maternal serum biochemical screening at 15–18 weeks gestation can in combination with maternal age, identify 60% of pregnancies associated with Down syndrome, which occur in the 5% of the population shown to be at high risk. This form of screening and selective invasive testing has become a feature of antenatal care in many hospitals in the UK. The utility of this test has been assessed as part of research projects [2], however, when applied to standard clinical practice the results may differ. Our practice is described with particular reference to the appropriateness of a cut-off point for invasive testing set at a risk of 1:250 for the diagnosis of Down syndrome, to maintain a 5% screen positive rate.

All women who book in the first trimester of pregnancy are counseled on the triple test but not routinely offered first trimester diagnostic testing, however, if specifically requested it would be provided.

This study reviews the data derived from one maternity hospital over a 5-year period.

2. Patient and methods

Triple tests (maternal serum estriol, alpha fetoprotein and human chorionic gonadotrophin (hCG)) were offered to all patients who booked at the appropriate gestation during this period (from April 1994 free βhCG was used in place of total hCG). The decision to use free βhCG was based on a review of the literature [3]. Subsequent retrospective analysis revealed an increase in screen positive cases from 2.9% (May 1992–April 1994) to 5.7% (May 1994–April 1997). All women received individual counseling with a midwife prior to testing and if amniocentesis was requested without prior triple testing this request was granted. Amniocentesis was not offered routinely on an age-related risk. The counseling involved the midwife discussing an information sheet with the patient. The information sheet included details of the triple test, its aim and how the result would be managed. The information sheet was then given to the patient for further consideration. Telephone numbers of both the antenatal clinic and the delivery suite were on the information sheet should the patient have any queries. This information was given at the booking visit at 8–13 weeks gestation. If the patient requested a triple test a date was given. At the time of the triple test patients were again afforded time for further discussion. At the time of this analysis, low-risk results less than 1:250 were not communicated to the patients unless they requested before their next antenatal visit at 18–20 weeks. Women who tested positive (a risk of Down syndrome of 1/250 or greater) were informed via a home visit from the community midwife and an appointment was arranged to see a consultant for further discussion.

The study covers 5 years (1 May 1992–30 April 1997). All booking patients were identified from the antenatal clinic records. During the time period under review, triple testing was offered to all. The positive triple test results (1/250 or greater) were identified via laboratory computerized records (Immunoassay Laboratory, Hull Royal Infirmary). All patients who underwent either a chorionic villous sample (CVS) or an amniocentesis were identified via the regional cytogenetics laboratory computerized records (St. James University Hospital, Leeds).

In particular data were collected on:

1. those women who screened positive and declined invasive testing;
2. those women who requested invasive testing despite either a negative screening test or no prior screening; and
3. those pregnancies associated with Down syndrome.

Case notes of the two groups of patients were examined as were the notes of all women who delivered or terminated a pregnancy with Down syndrome during this period.

3. Results

During the study period, 18 890 women booked at Hull Maternity Hospital (see Fig. 1). Of these, 14 827 (78%) opted for the triple test. A positive result (1/250 or greater) was found in 586 (4%) of women. Further testing with amniocentesis was refused by 88 (15%) of this sub-group of women. Seventy-four declined an amniocentesis after an appraisal of the risks involved, 13 women could not contemplate a termination of pregnancy, and one woman was lost to follow up.

Of those that had a negative triple test, seven requested an amniocentesis for reassurance (median risk 1/940; range 1/300–1/3200). Seventy-five patients requested an amniocentesis without a prior triple test. In 51 cases maternal age was the sole basis for the request. A further 13 patients requested an amniocentesis on the basis of either not wanting a triple test, the identification of soft markers on ultrasound or a past history of a high triple test. Eleven patients had an amniocentesis or CVS on the grounds of a previous affected child or a family relative with Down syndrome. No cases of Down syndrome were identified in these 75 patients.

In the study period, 10 babies with Down syndrome were born; of these six had prenatal screening. All six had a risk factor outside the level at which diagnostic testing would be routinely offered in our unit. Their results had a range of 1/390–1/21 100 with a median of 1/1100. One of six screen-negative pregnancies had an amniocentesis for severe intrauterine growth retardation and the pregnancy was continued after the diagnosis of Down syndrome was made.

In addition to the birth of 10 babies with Down syndrome, another nine pregnancies underwent termination of pregnancy following a positive amniocentesis or CVS. Two of the nine diagnosed cases followed a CVS procedure, both cases had prior triple testing and CVS was performed in one case following failed amniocentesis and one case by patient request for a quicker result.

Of the screened pregnancies the triple test and selective invasive testing identified nine out of 15 (60%) Down syndrome cases.

4. Discussion

In routine clinical practice 60% of Down syndrome cases were identified by the triple test and a selective invasive testing rate of 4%, a figure slightly less than the 5% rate quoted in the literature [4].

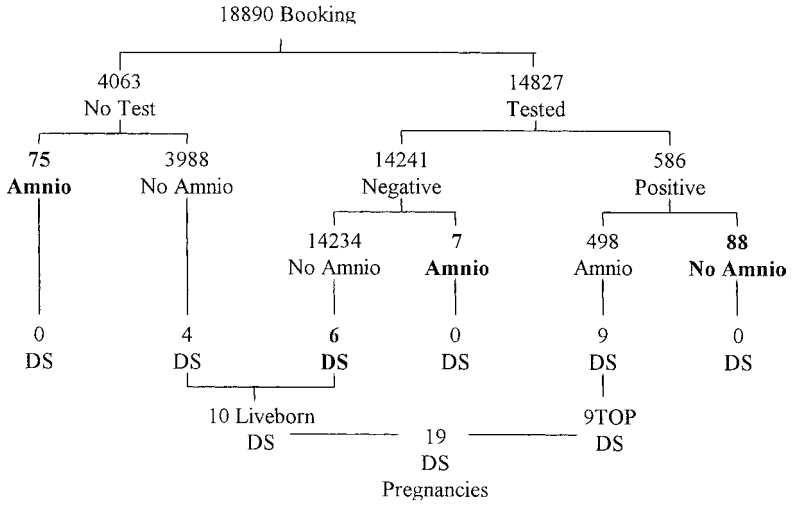

Fig. 1. 18 890 patients booking at Hull Maternity Hospital resulting in 19 diagnoses of Down syndrome.

Our data is derived from an unselected population and would appear to duplicate the earlier statistics on the utility of the triple test [2].

It is notable that the risk cut-off point (1/250), which was derived on the basis of acceptable screen positive rates, rather than from patient surveys, approximates the excess miscarriage risk of an amniocentesis [5]. These data indicate that approximately 15% of women with a risk of greater than 1:250 and 0.08% of women with a risk less than 1:250 do not agree with this cut-off point which assumes an equal perception of the undesirability of a procedure-related pregnancy loss and the birth of a baby with Down syndrome.

The information women are given may influence how they respond to prenatal diagnostic testing. In view of the fact that 15% of women who tested positive in our unit did not want invasive testing this area of information giving is undergoing further research.

In the majority of these the case notes recorded that the patient did not want an amniocentesis after appraisal of the risks involved. A small minority of women would not contemplate a termination of pregnancy. One can speculate whether these patients should ever have had the triple test performed and whether improvements in the counseling process should be considered. This possible lack of understanding of the test has previously been highlighted by others [6].

Only seven patients who had a negative test requested amniocentesis (0.08%). This small proportion is in accordance with published literature [7] indicating a request for an amniocentesis because of a different perception of the balance of risks. This suggests a high degree of acceptance of the test and the cut off level in our population.

In conclusion, 60% of Down syndrome pregnancies were identified with a 4% invasive testing rate. Fifteen percent of women who had a positive triple test did not agree with the cut-off point of 1:250 and therefore declined invasive testing.

Invasive procedure complication rates do not equate with patients' perception of Down syndrome.

References

[1] Mutton DE, Alderman E, Bobrow M. Analysis of national register of Down syndrome in England and Wales: trends in prenatal diagnosis. Br Med J 1993;306:431–432.

[2] Cuckle HS, Wald NJ, Thompson SG. Estimating a woman's risk of having a pregnancy associated with Down syndrome using her age and serum alpha-fetoprotein level. Br J Obstet Gynaecol 1987;94:387–402.

[3] Macri JN, Kasturi RV, Krantz DA, Cook ES, Moore ND, Young JA, Romera K, Larsen JW. Maternal serum Down syndrome screening: free β-protein is a more effective marker than human chorionic gonadotrophin. Am J Obstet Gynecol 1990;163:1248–1253.

[4] Wald NJ, Cuckle HS, Densem JW, Nanchahal K, Royston P, Chard T, Haddow JE, Knight GJ, Palomaki GE, Canick JA. Maternal serum screening for Down syndrome in early pregnancy. Br Med J 1988;297:883–887.

[5] Medical Research Council. European Trial of Chorion Villus Sampling. Lancet 1991;337:1491–1499.

[6] Smith DK, Shaw RW, Marteau TM. Informed consent to undergo serum screening for Down syndrome: the gap between policy and practice. Br Med J 1994;309:776.

[7] Thornton JG, Lilford RJ. Prenatal diagnosis of Down syndrome, a method for reassessing the consistency of women's decision. Med Decis Mak 1990;10:288–293.