

PERFORMANCE OF SECOND TRIMESTER MATERNAL SERUM SCREENING IN SOUTH AUSTRALIA

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INTRODUCTION

Maternal serum screening for chromosomal abnormalities using four analytes (alphafetoprotein, free alpha and free beta chorionic gonadotropin, unconjugated estriol) was introduced as a service in South Australia in 1991. More than 85,000 pregnancies have subsequently been screened.

Between 1991 and 1997 the improving performance of the South Australian Maternal Serum Antenatal Screening (SAMSAS) Programme has had a significant impact on obstetric practice in South Australia.

RESULTS

NEURAL TUBE DEFECTS SCREENING

YEARS	TOTAL SERA	RAISED NTD RISK	DETECTED
1991 -1996	85,565	2,567 (3%)	89/103 (86.4%)

DOWN SYNDROME SCREENING

YEAR	"increased risk of Down syndrome"		RECALL RATE	DETECTED
	<35yrs	≥35yrs		
1991-92	292 / 6513	122 / 516	5.9%	57.1% (4/7)
1993	324 / 9103	109 / 578	4.5%	55.0% (11/20)
1994	343 / 10821	123 / 714	4.0%	73.3% (11/15)
1995	453 / 10553	193 / 828	5.7%	64.7% (11/17)
1996	594 / 11188	251 / 937	7.0%	80.0% (12/15)
1997	563 / 10445	210 / 965	6.8%	81.5% (22/27)

ADDITIONAL CONDITIONS SCREENED

	PREVALENCE	DETECTION
Unsuspected Twin Pregnancy	1 : 1000	99%
Failed Pregnancy	1 : 1000	99%
69XXX (Triploidy)	1 : 15000	78%
Trisomy 18 (Edwards syndrome)	1 : 8500	70%
Overstated Gestational Age	1 : 100	99%

IMPACT OF CHANGES IN OBSTETRIC PRACTICE ON SAMSAS PROGRAMME PERFORMANCE

Accuracy of gestational age assessment is critical for good performance of maternal serum screening.

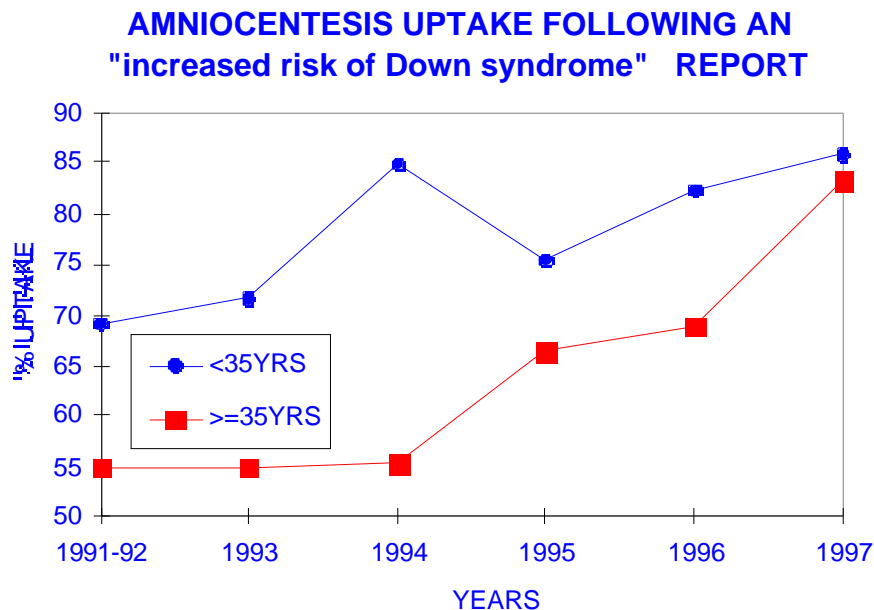
- 28.9% of all mothers in South Australia now have their pregnancies assessed by early ultrasound (less than 12 weeks gestation), increased from 15.1% in 1991.
- The number of specimens submitted from pregnancies more than 3 weeks overstated in gestation has fallen from 1.2% to 0.4% (90% of these produce an "increased risk of Down syndrome" result).
- Those medical centres which have highest use of ultrasound in gestational age assessment have fewest corrections of results following the issuing of an "increased risk" report.

The Use of Ultrasound Dating and Correction of "increased risk" Results

Centre	% g.a. by u/s	% Corrected
1	54.7	41.1
2	56.8	40.0
3	77.0	24.6
4	95.3	7.3
5	95.6	10.2

IMPACT OF SAMSAS PROGRAMME PERFORMANCE ON OBSTETRIC PRACTICE

As the detection of affected pregnancies has increased, the uptake of amniocentesis following the issuing of a report stating "increased risk of Down syndrome" has also increased from 64.9% to 85.1%.



The increased acceptance of SAMSAS Programme results is most noted in mothers aged 35 years or more at delivery. The practice of offering these mothers amniocentesis as a first-line test for fetal Down syndrome is being replaced by offering amniocentesis only after a maternal serum screening result reports "increased risk".

The number of amniocenteses performed for each case of fetal Down syndrome detected has fallen from 169 (in 1991) to 58 (1997). This has had a significant impact on the number of healthy fetuses lost following amniocentesis. 1 healthy fetus is now lost for every 3 affected pregnancies found compared to 1 lost for every 1 affected pregnancy found in 1991.

OTHER IMPACTS

- the number of mothers aged more than 35 years at delivery in South Australia has increased from 9.2% in 1991 to 13.5% in 1997;
- the prevalence of fetal Down syndrome in the screened population has increased from 1.08/1000 births to 1.27/1000 births;
- the detection of affected pregnancies has increased to 80% in 1997 from 32% in 1991 (pre maternal serum screening);
- the number of women to whom amniocenteses is offered has fallen from 1840 (9.2% of population in 1991) to 1360 (6.8% of population in 1997) *per annum*;

SUMMARY

- **Close cooperation between all those involved in obstetric management can produce a high performance antenatal screening service;**
- **A high performance maternal serum screening programme can have a considerable and beneficial impact on obstetric practice, particularly in the care of older mothers;**
- **Performance of the screening programme is improved by high quality information from obstetric practice, particularly in regard to the accuracy of gestational age estimation;**
- **The South Australian Maternal Serum Antenatal Screening Programme currently detects one pregnancy affected by fetal Down syndrome for every 58 amniocenteses performed (81.5% of all affected pregnancies screened).**