OUTCOME OF MID-TRIMESTER PREGNANCIES COMPLICATED BY OLIGOHYDRAMNIOS. QUANTITATIVE EVALUATION OF THE PROGNOSTIC VALUE OF MATERNAL SERUM ALPHA-FETOPROTEIN LEVEL

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Introduction

Obstetric significance of oligohydramnios appearing in the last period of pregnancy is well known. Mid-trimester oligohydramnios observed in the second trimester is a rarer condition, and its management is rather ambiguous. It is often connected with life-incompatible urinary tract malformations, but the pregnancies result mostly in miscarriage or perinatal death also in the lack of malformation. Reviewing the attainable literature, one can learn of only 16 healthy newborns surviving the perinatal period among the more than 120 cases reported.

In our study we analyse our 182 cases in similar respects, and, in addition, try to find a connection between maternal serum alpha-fetoprotein concentration (MSAFP) and the outcome of pregnancies.

Materials and methods

In the last six years we performed screening ultrasound examinations at 18th-20th weeks of gestation in more than 65 000 pregnancies. Oligohydramnios was diagnosed when the largest amniotic fluid pocket was no greater than 1 cm in any vertical plane. If no life-incompatible malformation was seen, ultrasound was repeated 2-3 weeks later, and only the repeatedly detected, definite cases were included, except if meanwhile a spontaneous abortion occurred.

Preceding the ultrasound MSAFP was measured at 16th week of gestation in a great part of patients, accordingly to our

regional screening program (7). 2.5 MoM (multiple of median) or higher AFP concentrations were considered to be elevated.

Patients with multiple pregnancy or intrauterine demise revealed by the initial scan were not included. Cases with unambiguous symptoms of premature rupture of membranes were also excluded.

Elective pregnancy termination was advised if a life-incompatible malformation was obviously demonstrated, or serial ultrasound showed progression (no fluid, massive deformations, growth ceased, bradycardia). The overwhelming majority of couples has accepted this. Our proposals were not influenced by the MSAFP results.

Terminations (and frequently miscarriages and deliveries) occurred mostly in our institute, and detailed fetal pathological examinations were performed. Pregnancy outcome data were collected also from other institutes in each case.

Results

Considering the conditions mentioned above oligohydramnios was found in 182 mid-trimester pregnancies. Elective pregnancy termination was performed in 103 cases. 79 pregnancies (100%) continued, but 23 of them (29%) resulted in spontaneous abortion, 14 (18%) in missed abortion, 9 (11%) in intrauterine death, and 11 newborns (14%) died in the perinatal period. 22 newborns (28%) survived, this is 12% of the all cases. Congenital malformation was detected as pathological background of oligohydramnios in 78 cases (43%).

MSAFP was measured in 65 % of pregnancies. Taking into account only these cases, MSAFP was normal (or low) in 19 of the 21 surviving cases (91%), and elevated in two cases (9%). On the other hand, 15 of the 27 spontaneous and missed abortions were preceded by an elevated MSAFP value (56%). Concerning the cases with malformation, it is noteworthy, that MSAFP was normal (or low) in 12 patients of the 13, who gave birth to fetuses with bilateral multicystic kidneys (type Potter II).

Outcome of pregnancies with different MSAFP is demonstrated in Table 1. In the group with MSAFP under 2.5 MoM there were 19 surviving infants (29.7%), whereas in the other one with elevated MSAFP only two (3.6%). In four cases of the first group partial urethral obstruction caused the abnormal ultrasound findings, then the postnatal treatment was successful. The others had no anomalies.

Table 1. Outcome of Pregnancies Complicated by Second Trimester Oligohydramnios

MSAFP at 16th week		elective pregnancy termination	spontaneous and missed abortion	peri-natal death	alive after the peri-natal period	TOTAL
determined/all cases		59/103	27/37	12/20	21/22	119/182
NORMAL LOW[x]	A) Number of cases	26	12	7	19	64
	(%)	(40.6)	(18.7)	(10.9)	(29.8)	(100)
	B) No primary malformation by ultrasound (%)	14 (31.2)	11 (24.4)	5 (11.1)	15 (33.3)	45 (100)
ELEVATED[xx]	A) Number of cases (%)	33 (60)	15 (27.3)	5 (9.1)	2 (3.6)	55 (100)
	B) No primary malformation by ultrasound (%)	23 (53.5)	15 (34.9)	3 (7.0)	2 (4.6)	43 (100)

x < 2.5 MoM
xx ≥ 2.5 MoM

Table 2. demonstrates the accuracy of MSAFP level for predicting abnormal outcome, taking into account the cases of lines a) lines b) of table 1., and lines b) excluding elective pregnancy terminations, respectively. High values of specificity and positive predictive values are impressive.

Table 2. Accuracy of MSAFP for Predicting Abnormal Outcome[x] of Pregnancies Complicated by Oligohydramnios in the Second Trimester

Concerned groups	Specificity	Sensitivity	Positive predictive	
All cases with oligohydramnios and MSAFP determined	90.5%	54.1%	96.3%	29.6%
Oligohydramnios without ultrasonically detectable malformation	88.2%	57.1%	95.3%	33.3%
Elective pregnancy terminations excluded	88.2%	52.9%	90.0%	48.4%

[x]Abnormal outcome is defined as spontaneous and missed abortion, perinatal death and elective pregnancy termination. Elevated MSAFP was used to predict abnormal outcome.

Discussion

Oligohydramnios diagnosed in the second trimester means an especially poor prognosis. Barrs et al (2) reported on a series of 38 pregnancies of their own and of the literature, and only one of them had a normal outcome. There were 8 surviving newborns among the 34 cases of Mercer et al (6). Our material shows a similar prognosis (22/182).

It is a more difficult task for the counselling obstetrician, if no life-incompatible malformation can be seen on ultrasound. Though the prognosis is unfavourable also in such cases, live births of normal children can often occur. (As regards our material, 18/121.) Therefore it seems to be necessary to search other factors, that can help us to manage these pregnancies.

MSAFP evaluation is extensively used for screening of neural tube defects. Regardless of this, elevated MSAFP means a higher

risk for the pregnancy outcome in a general sense (low birthweight, fetal distress, perinatal death) (4).

There have been a limited number of cases reported in which elevated MSAFP levels and second trimester oligohydramnios coexist (1,3,5,8-10). However, these authors have not studied oligohydramnios cases with normal MSAFP. Others (2,6) avoid this preselection of patients, but do not measure MSAFP level at all. There is no preliminary report on the comparison of outcome with elevated and normal MSAFP. Reviewing the literature mentioned above, there were 7 of 52 pregnancies producing surviving infants in the group with elevated MSAFP, and 9 of 72 in the unselected group.

For what reason can one suppose a connection between oligohydramnios and elevated MSAFP? Except of neural tube defects, elevation of MSAFP can occur through the damage of barrier function of placenta or membranes (haemorrhagia, necrosis of subclinical degree, incomplete rupture of membranes). This can result in an elevation of MSAFP, loosing of the dynamic balance of amniotic fluid circulation, oligohydramnios, then intrauterine demise, abortion, birth of premature newborn with hypoplastic lungs (3).

The extension of these pathophysiological processes can be very variable, and this corresponds to the low value of sensitivity of MSAFP evaluation to screen adverse outcome. However, the high specificity and positive predictive value convince us that the elevation of MSAFP and the mid-trimester oligohydramnios with extrafetal origin are closely related.

On the basis of our data we propose to take MSAFP into consideration when no primary malformation can be detected by ultrasound in a mid-trimester oligohydramnios case. Pregnant women with more than 2.5 MoM MSAFP should be treated for threatening abortion even if they have no symptoms. If the couple gets to know the poor prognosis in due time, more time will be left to accept the idea of elective pregnancy termination in the case when the oligohydramnios proves to be progressive.

References

(1) Balfour, R P, K M Laurence: Raised serum AFP levels and fetal renal agenesis. Lancet 1 (1980) 317

(2) Barrs, V A, B R Benacerraf, F D Frigoletto Jr: Second trimester oligohydramnios, a predictor of poor fetal outcome. Obstet Gynecol 64 (1984) 608

(3) Dyer, S N, B K Burton, L H Nelson: Elevated maternal serum alpha-fetoprotein levels and oligohydramnios: poor prognosis for pregnancy outcome. Am J Obstet Gynecol 157 (1987) 336

(4) Hamilton, M P R, H I Abdalla, C R Whitfield: Significance of raised maternal serum alpha-fetoprotein in singleton pregnancies with normally formed fetuses. Obstet Gynecol 65 (1985) 465

(5) Koontz, W L, J W Seeds, N J Adams, A M Johnson, C C Robert: Elevated maternal serum alpha-fetoprotein, second trimester oligohydramnios, and pregnancy outcome. Obstet Gynecol 62 (1983) 301

(6) Mercer, L J, L G Brown: Fetal outcome with oligohydramnios in second trimester. Obstet Gynecol 67 (1986) 840

(7) Papp Z, Tóth Z, Szabó M, Csécsei K, Török O: Prenatal screening for neural tube defects and other malformations by both serum AFP and ultrasound. In: Kurjak, A (ed): The Fetus as a Patient. Elsevier Science Publishers B W, Amsterdam - New York - Oxford, 1985

(8) Richards, D S, J W Seeds, V L Katz, L H Lingley, S C Albright, R C Cefalo: Elevated maternal serum alpha-fetoprotein with oligohydramnios: ultrasound evaluation and outcome. Obstet Gynecol 72 (1988) 337

(9) Seller, M J, A H Child: Raised maternal serum alpha-fetoprotein, oligohydramnios, and the fetus. Lancet 1 (1980) 317

(10) Stirrat, G M, J D Gough, S Bullock, N J Wald, H S Cuckle: Raised maternal serum AFP, oligohydramnios, and poor fetal outcome. Br J Obstet Gynaecol 88 (1981) 235