

CHANGES OF LIVER AND ELECTROLYTIC PROFILE IN SLIGHT, MODERATE AND SEVERE EPH-GESTOSIS IN COMPARISON WITH CASES OF INTRAUTERINE FETAL DEATH

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SUMMARY

During an examination period of 18 months a prospective study was carried out at the 1st Dept. Obst. Gyn., Univ. of Vienna, in all women under clinical treatment with slight, moderate or severe gestosis and in all gravidae with a fetus died in utero. The examinations comprised tests of liver function (bilirubin, SGOT, SGPT, alkaline phosphatase) and electrolytic changes (Na^+ , K^+ , Ca^{++}). According to the severity of gestational toxicosis the 81 cases in total were classified in three groups. Gravidae with an intrauterine fetal death ranged as a separate group. The comparison of the three groups of patients was not surprising. As increasingly severe signs of EPH-gestosis were observed also pathological liver signs grew worse. If these findings of continued but disturbed pregnancies were compared to the findings in women with a fetus died in utero a threshold value of pathological findings and also of findings under routine examinations was observed.

If this threshold value is crossed in case of a fetus with mature lungs it is demanded to speed up the course of labour and complete delivery to prevent the intrauterine death of the fetus.

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Various facts about liver control in cases of EPH-gestosis in the literature gave us the impetus to report on a study still in progress on 81 patients who are being tested for their minimal to severe EPH-gestosis with regard to their liver and kidney functions, as well as their electrolytic profile. Various medical histories, type of termination of pregnancy, as well as fetal mass were examined.

MATERIAL

77 of the 81 patients were continuously examined in our outpatient clinic for obstetrics and gynecology or in our wards for risk pregnancies. Four patients with pathologic pregnancies were cared for at different hospitals before they were referred to us for signs of intrauterine fetal death. All of these patients were examined at regular intervals for liver and kidney functions and electrolytic values alongside their routine examinations with regard to their pregnancy. After two twin-pregnancies were terminated, 79 patients remained under our care.

All their data were fed into the computer of the Vienna General University Hospital Computing Center and evaluated statistically. Three groups were formed: the group with intrauterine fetal deaths was compared with two collective groups – one with a gestosis index of 1-3 and one with a gestosis index 4. The index was evaluated after a chart by *Goecke*. The groups were divided according to the highest gestosis index per pregnancy.

The statistic evaluation was made according to *Levene* for equality of variances, and for unequal variances according to *Kruskal-Wallis* (using CHI-Square distribution with degrees of freedom). The total evaluation pertains to all three groups respectively.

Severe gestoses or eclampsias have become rather rare in Austria in the past few years, due to regular checkups and intensive care given to pregnant women. Since severe gestoses afford more frequent examination and a higher number of tests, Group II consists of the largest number of patients.

RESULTS

Comparing the 3 collectives, the only significant difference can be seen in the patients, where women exhibiting intrauterine fetal death have an average age of 34.6. The remainder of the patients are identical. However, all three groups

Table 1. — *Material.*

	GI 1-3 (N=15) M±SD	GI≥4 (N=56) M±SD	I.U. ✕ (N=8) M±SD	Significance
Age	28.3± 6.3	27.9± 6.2	34.6± 4.5	P=0.0171
Former deliveries	1.0± 1.6	0.7± 0.8	0.7± 1.4	N.S.
Weights before pregnancy (kg)	71.3±15.3	74.9±20.5	68.1±11.4	N.S.
Heights (cm)	167.3± 6.2	163.7± 6.4	159.3± 8.3	N.S.

exhibit a weight significantly above average (tab. 1).

A comparison of the medical history with regard to hypertension, hepatitis or nephroses showed only slight differences. A history of pathologic pregnancies (late gestosis, eclampsia) was often referred to by patients in groups II and III, however, the differences could not be evaluated statistically. Electrolytic profiles also showed no significant differences (⁷).

The criteria for grouping patients show significant differences with regard to average gestosis index. The high index in group III proves the correlation between EPH-gestosis and intrauterine fetal death. An interesting fact is pointed out in line 2, which shows, that severe toxicoes were discovered somewhat sooner, but the differences are insignificant (tab. 2). Women with severe gestoses were delivered prior to term, where the percentage for operative birth was significantly higher than in the two other groups. Intrauterine fetal death averaged 3 weeks after the highest gestosis index was determined.

The liver values in the various collectives, whereby only the respective highest

values were taken into consideration for statistical examination, rose continually from group to group. With SGPT and alkaline phosphatases the differences were significant (tab. 3).

Kidney values, BUN and creatinine in group I were lowest, and highest in group III. However, statistically there was no significant difference (tab. 4).

The last figure gives information about "fetal outcome". In the collective gestosis index = 4 or above, as well as in the weight of the newborn, relatively good values can be observed. This holds true even for "Apgar" evaluation. Significant differences can only be made on the basis of group III (tab. 5).

DISCUSSION

If the results of this short interim report are summed up, only insignificant differences result between group I and group II. A partly continuing rise of the various values, depending on the severity of the EPH gestoses, however, makes it seem appropriate to take early therapeutic measures.

Table 2. — *Index of gestosis in relation to week of pregnancy.*

	GI 1-3 (N=15)	GI≥4 (N=56)	I.U. ✕ (N=8)	Significance
GI (\bar{x} ±SD)	2.1±1.2	5.2±1.3	6.5±3.2	—
Week with highest GI	34.2±6.5	32.7±8.7	31.3±5.7	N.S.
Week of delivery	40.0±2.9	38.7±3.1	34.4±3.1	P=0.0003

Table 3. — *Liver control.*

	GI 1-3 M±SD	GI≥4 M±SD	I.U. ✕ M±SD	Significance
Bilirubin	0.48± 0.16	0.67± 0.49	0.78± 0.84	N.S.
SGOT (IU/l)	9.3 ± 3.9	15.2 ±18.1	86.9 ±191.4	N.S.
SGPT (IU/l)	6.5 ± 3.7	13.4 ±19.5	28.9 ± 35.3	P=0.0398
Alk. phosph. (IU/l)	157.0 ±87.2	157.5 ±66.9	230.2 ± 97.1	P=0.0365

Table 4. — *Renal control.*

	GI 1-3 M±SD	GI≥4 M±SD	I.U. ✕ M±SD	Significance
BUN	13.4 ±6.0	16.7 ±11.7	19.1±8.0	N.S.
Kreatinin	0.75±0.18	0.84± 0.19	1.2±0.49	N.S.

The rise in the SGPT values is most significant. Dass and Bhagwanani⁽³⁾ report on similar results. The alkaline phosphatase rises even in most normal pregnancies significantly. Sadovsky and Zuckermann⁽⁶⁾ proved this in 1965, Thorling⁽⁸⁾ reported this already in the '50's. When gestosis occurs, there is often an especially steep rise in the alkaline phosphatase values even these may not always depend on the severity of gestosis. Bagga *et al.*⁽¹⁾ tried to prove the relatively high differences in the values of non-pregnant women and those with normal pregnancies in a comparative study. Bilirubin values are the least ones affected in the liver-values pertaining to gestosis. Therefore,

these tests in group I with a gestosis index of 1-3 are totally insignificant.

The good Apgar values and relatively high birth weight in group II are due to continuous patient care and partial early stationary observation and treatment.

If the tests in women with still intact but abnormal pregnancies are compared to the ones of women with intrauterine fetal death, the liver and kidney functions seem to give important facts with regard to the development of the pregnancy^(2, 4). If these values are exceeded, the birth process should be completed as soon as possible in a fetus with mature lungs in order to avoid intrauterine death.

Table 5. — *Fetal outcome.*

	GI 1-3 (N=15) M±SD	GI≥4 (N=56) M±SD	I.U. ✕ (N=8) M±SD	Significance
Weight (g)	3007±564	3000±737	1552±619	P<0.0001
Length (cm)	48.5±1.8	48.3±3.1	41.5±5.5	P=0.0112
Placental weight (g)	498±98	500±149	316±177	P=0.0079
Apgar: 1'	7.7±2.5	7.8±2.8	0	—
5'	9.4±1.3	9.5±1.1	0	—

However, the small number of cases do not allow a definite statement. The continuation of our study and further tests should facilitate, that a certain evaluation can be made from a broad spectrum of diagnostic tests.

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