Prediction of Fetal Distress by Low Intra-amniotic Lysozyme Level

Milan M. Terzic, MD, PhD*, Darko Plecas, MD,PhD,*
Mirko M. Bulajic, MD, PhD,* Bojan Stimec, MD,MSc,+
Bratislav Velimirovic, MD, PhD#

*Department of Obstetrics and Gynaecology,
+Institute of Anatomy, School of Medicine, University of Belgrade, Yugoslavia
Department of Pharmacology, University of Illinois, Chicago, USA

Abstract : *Lysozyme activity was determined in amniotic fluid samples of 82 pregnant women at the end of gestation (37-40 wks). Forty eight specimens were from normal, while 34 were taken from high-risk pregnancies: Rh-alloimmunisastion, hydramnios, diabetes mellitus complicated by pregnancy-induced hypertension, diabetes mellitus with Rh-alloimmunisation, and Rh-alloimmunisation complicated by pregnancy-induced hypertension. Signs of fetal distress were present in 18 high-risk pregnancies. Lysozyme concentration in amniotic fluid was significantly lower in patients with signs of fetal distress, suffering from Rh-alloimmunisation[1-5], and diabetes mellitus with Rh-alloimmunisation[3]. Our data support the possibility of using the intraamniotic lysozyme level as a predictor of fetal distress. (Thai J Obstet Gynaecol 1994; 6:19-21.)*

Key words : lysozyme, amniotic fluid, fetal distress

Studies performed at the end of the first trimester confirmed that exocoelomic fluid is a transudate of the maternal serum. Amniotic and exocoelomic cavities are separated by a non-permeable membrane[(1)]. Fetoplacental unit is a source of large amounts of lysozyme[(2)].

Lysozyme intra-amniotic levels were found to increase according to the progression of gestation, reaching maximal values at term[(3)]. Exhibiting microbial growth-inhibitory activities lysozyme improves perinatal outcome[(4)]. However, lysozyme intra amniotic level patterns in high-risk pregnancies are not clearly understood.

Materials and Methods

Ammiotic fluid samples were obtained under ultrasound control in 82 pregnant women at the end of gestation. Forty eight specimens were from normal, while 34 were taken

from high risk pregnancies: Rh-alloimmunisation, hydramnios, diabetes mellitus complicated by pregnancy-induced hypertension, diabetes mellitus with Rh-alloimmumisation, and Rh-alloimmunisation complicated by pregnancy-induced hypertension. Signs of fetal distress were present in 18 cases. During the procedure, amniotic fluid specimen from the first Syringe was used for lysozyme determination and for the analyses the ACT was done for, in addition from the second one for microbial testing. Lysozyme activity was determined by original Behring kits (Testomar-Lysozyme Mono). Samples from the second syringe were inoculated onto blood agar and chocolate agar for aerobic microorgaisms and onto prereduced anaerobically sterilized peptone-yeast extract-glucose media, blood agar and chocolate agar for anaerobic microorganisms. Obtained specimens were also cultured for genital mycoplasmas by inoculation onto Mycotrim diphasic media (Hana Biologicals, Inc., Berkeley, Calif. USA) that was incubated 7 days. Microorganisms were identified with standard methods. Fluids contaminated with blood, those from patients complicated by ruptured membranes were discarded. Also, patients with clinical signs of premature labour were not included in the study.

Results

Investigating lysozme intra-amniotic levels we found significantly lower values in patients with Rh-alloimmunisation and those with diabetes mellitus and Rh alloimmunisation ($p<0.01$) (Table 1). In all these pregnancies there were signs of fetal distress.

Discussion

Antibacterial activity of amniotic fluid may protect patient from chorioamnionitis and resultant preterm delivery[4]. Lysozyme is confirmed to be the most important bacterial growth inhibitor. In the previous study

Table 1 *Intra-amniotic Lysozyme Level (Term Pregnancy)*

ACT indication	No. of patient	Lysozyme level (mg/l)		
		mean	SD	range
I-Term ACT	48	23.60	6.38	14- 28
II-Rh-alloimmunisation	15	7.20	4.83	3- 15
III-Hydramnios	7	22.14	7.62	14- 29
IV-Diabetes mellitus+PIH	6	17.50	1.64	16- 19
V-Diabetes mellitus+Rh-alloimmunisation	3	7.60	0.45	7.2- 7.8
VI-Rh-alloimmunisation+PIH	3	19.5	0.36	19.1-19.9

PIH-Pregnancy induced Hypertension

we confirmed that lysozyme levels increased according to the progression of gestation, reaching maximum at term[3]. Also, there was a strong relationship between high lysozyme level and sterile amniotic micro-environment [5]. In the present study all amniotic fluid specimens were sterile. A number of authors have previously described lysozyme concentrations in amniotic fluid[6,7]. But until now, only Porto et al[8] has reported that lyso-zyme concentrations were lower in high-risk pregnant women with signs of fetal distress. In this study we demonstrated that amniotic fluid lyso-zyme level exhibit a pattern of activity related to the pathological state of pregnancy. Namely, lysoyzme intra-amniotic levels were significantly lower in all patients with fetal distress, suffering Rh-alloimmunisation and those with diabetes mellitus and Rh-alloimmunisation.

In conclusion, lysozyme intra-amniotic levels could serve as a predictor of fetal distress.

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