

## UMBILICAL CORD PLASMA ERYTHROPOIETIN (EPO) IN PROLONGED PREGNANCIES AND ITS RELATION TO THE FETAL OUTCOME

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### **ABSTRACT**

**Objectives:** This study was designed to evaluate different methods of assessment of fetal well being (BPP, NST, Doppler analysis) and to compare them with the validity of erythropoietin (EPO) as a marker of fetal affection in prolonged pregnancies. **Study Design:** This study was comparative prospective study carried out over one year in Ain Shams University Maternity Hospital from April 2000 to April 2006. **Patients & Methods:** Eighty (80) patients were included in this study after informed consent and divided into two groups, twenty normal pregnant women (37- 40 weeks) were included in group I (control group) and sixty post-term pregnant women (41- 42 weeks) were included group II (post-term). Patients included in this study were sure of dates, the gestational age was detected by calculating the patients dates from the first day of the last menstrual period and early ultrasound scanning. **Methods:** After complete history, standard general and abdominal examinations were done, followed by some laboratory investigations such as CBC, Rh typing, blood glucose, kidney function and liver function tests. The trans-abdominal ultrasound was done for the patients to confirm the gestational age and placental grading followed by biophysical profile (BPP) and non stress test (NST). Then Doppler wave form analysis of the umbilical artery and middle cerebral artery was done. At delivery the color of amniotic fluid was detected, the Apgar score was recorded at 1, 5 minutes and cord blood sample was collected for assessment of erythropoietin level. **Results:** in this study, the fetal birth weight was significantly higher in the post-term group ( $3.6 \pm 1.2$ ) than control group ( $3.126 \pm 0.94$ ); and the presence of meconium during delivery was significantly higher in the post-term group (30%) than control group (0%). The MCA PI in this study was significantly lower in post-term group ( $1.14 \pm 0.07$ ) than the control group ( $1.19 \pm 0.01$ ) ( $P < 0.001$ ). There was a high significant relation between the fetal outcome in the post-term group and MCA (S/D)/UA (S/D) ratio ( $P < 0.001$ ), the adverse fetal outcome in post-term group increased when the MCA (S/D)/UA (S/D) ratio was  $< 1.0$  ( $P < 0.001$ ). There was a high significant relation between the Apgar score and MCA (S/D)/UA (S/D) ratio, When the MCA (S/D)/UA (S/D) ratio was  $< 1.0$ , the mean Apgar score was  $0.7 \pm 1.7$  and when the MCA (S/D)/UA (S/D) ratio was  $> 1.0$ , the mean Apgar score was  $9.4 \pm 1.1$  ( $P < 0.001$ ). The UA PI was significantly lower in post-term group with adverse outcome ( $0.78 \pm 0.00$ ) than the post-term group without adverse outcome ( $0.88 \pm 0.00$ ) ( $P < 0.001$ ). The UA & MCA PI were significantly lower in the fetuses with AFI  $\leq 0$  cm, than fetuses with AFI  $> 0$  cm ( $P < 0.001$ ). The MCA (S/D)/UA (S/D) ratio was significantly lower in fetuses with AFI  $\leq 0$  cm, than fetuses with AFI  $> 0$  cm ( $1.126 \pm 0.29$  &  $1.02 \pm 0.39$  respectively), ( $P < 0.001$ ). In this study the level of fetal EPO was significantly increased as the gestational age increased ( $P < 0.001$ ), the EPO level was  $43.7 \pm 22.2$  mU/ml in post-term group without adverse outcome and was significantly elevated to  $70.8 \pm 27.9$  mU/ml in post-term group with adverse outcome ( $P < 0.001$ ). The cutoff value of EPO for adverse fetal outcome in post-term pregnancies in this study was  $30.7$  mU/ml. The sensitivity, specificity and predictive values of EPO and MCA (S/D)/UA (S/D) ratio were significantly higher than the AFI, BPP and NST in detection of adverse fetal outcome in post-term pregnancies ( $P < 0.001$ ). **Conclusion:** The sensitivity, specificity and predictive values of EPO and MCA (S/D)/UA (S/D) ratio were significantly higher than the AFI, BPP, and NST in detection of adverse fetal outcome in post-term pregnancies. **Key words:** Umbilical cord, erythropoietin, prolonged pregnancies, fetal outcome