Pregnancy in an anephric woman

To the Editors: A 42-year-old woman underwent bilateral nephrectomy and cystectomy after 12 years of recidivist urothelial tumors in both kidneys, ureters, and urinary bladder. She was put on periodic hemodialysis treatment and after a period of training was installed at home in April 1993. Since the beginning she was started on recombinant human erythropoietin and reached 10 g/dl with low doses in spite of anemia (stable schedule 33 U/kg/wk). She had two children, 18 and 16 years old, and very irregular menses, with amenorrhea since January 1994. In October she was seen for abdominal discomfort, and severe anemia with uterus (hemoglobin 5.9 g/dl, hematocrit 18%, ferritin 705 ng/ml, saturation 26%); ultrasonography showed mild fetal growth retardation and at 26 weeks' gestation she was admitted with premature labor and gave birth to a male infant weighing 550 gm, who died 30 minutes later.

Pregnancy in a woman requiring long-term dialysis is very uncommon, and when it occurs high residual renal function is usually maintained.1 Fetal loss because of prematurity is frequently the outcome.2 Our case illustrates a new cause of partial resistance to recombinant human erythropoietin action, only overcome after an important increase in dosage. An unexplained reduction in hematocrit may be the first sign of pregnancy in women treated with recombinant human erythropoietin in dialysis. Only one pregnancy has been previously reported in an anephric woman, who decided to terminate it electively.3 Therefore, no cases of successful pregnancy in anephric women have been described. Very few cases of pregnancies in women on dialysis receiving recombinant human erythropoietin have been reported,1,3,5 and to date there is no consensus for the use of recombinant human erythropoietin in this setting. Although detrimental effects of recombinant human erythropoietin in pregnancy cannot be suggested in our case, its use has not improved outcome of pregnancy4 and a note of caution must be underlined on its current use, because transfer of erythropoietin from mother to fetus has been demonstrated in mice.4

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REFERENCES


Effects of maternal inhalation of 40% oxygen on fetal oxygen saturation

To the Editors: In the paper by Dildy et al. (Dildy GA, Clark SL, Loncks CA. Intrapartum fetal pulse oximetry: the effects of maternal hyperoxia on fetal arterial oxygen saturation. Am J Obstet Gynecol 1994;171:1120-4) the authors found a significant increase in fetal arterial oxygen saturation (Sao2) after giving 100% oxygen to the mother during labor but did not find a change in fetal oxygen saturation at a maternal inspired oxygen concentration (Fio2) of 40%. The authors therefore question the efficacy of maternal oxygen therapy in which inspired oxygen concentrations are primarily <40%.

The authors pointed out that the effects of maternal oxygen therapy have been well studied in isolated gestational hypertension, diabetes, placenta previa, and preeclampsia on fetal oxygenation. These studies have led to recommendations for maternal oxygen supplementation to improve perinatal outcome. The authors concluded that maternal oxygen therapy is ineffective in improving fetal oxygenation and that Fio2 of 40% is not adequate to ensure fetal oxygenation. However, the authors did not address the effects of maternal oxygen therapy on fetal oxygenation in normal pregnancy, where the role of oxygen supplementation has not been well studied.

The authors suggested that maternal oxygen therapy may not be effective in improving fetal oxygenation in normal pregnancy. However, the effects of maternal oxygen therapy on fetal oxygenation in normal pregnancy have not been well studied. Further research is needed to determine the effects of maternal oxygen therapy on fetal oxygenation in normal pregnancy.

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With the authors' data concerning the short-term administration of 40% and 100% oxygen, we plotted the fetal SpO₂ increase against the initial fetal SpO₂ (Fig. 1). The Spearman rank correlation coefficient (rₛ) is −0.84 at 40% and rₛ = −0.85 at 100% FiO₂, which is statistically significant at both FiO₂ concentrations (p value 0.005 and 0.004, respectively). From the data points and a linear regression fit (see Fig. 1) it appears that when the initial fetal SpO₂ is around 40%, then the SpO₂ increase is > 15%, at both 40% and 100% FiO₂. At a higher initial fetal SpO₂ level (> 50%) no benefit is seen from 40% FiO₂, but 100% FiO₂ still has some effect on fetal SpO₂. The regression line crosses the x axis at 58% for 40% FiO₂ and at 73% for 100% FiO₂, so that there is a shift to the right with increasing maternal FiO₂.

A similar analysis applied to the authors' data on long-term (45 minutes) maternal oxygen inhalation of 40% oxygen does not show a significant correlation between initial value and increase of fetal SpO₂. This can partly be explained by the somewhat higher mean initial fetal SpO₂ in the long-term administration group compared with the short-term administration group (58% vs 50%). Other clinical characteristics of the two groups studied, for instance, different fetal heart rate patterns, might be other reasons for this observation.

Two animal studies on the assessment of the accuracy of fetal reflectance pulse oximetry report a precision of 5.5% to 6.6% at low saturation values. It is encouraging that the results of the study of Dildy et al. in human fetuses show some fairly good correlations and that fetal reflectance pulse oximetry is apparently a tool suitable for human physiologic studies.

The data of Dildy et al. suggest that maternal oxygen administration with both high (100%) and moderate (40%) oxygen concentrations is beneficial to those fetuses who are near a critical oxygen saturation range. Further studies using this new technique are warranted.

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REFERENCES

Reply
To the Editors: We appreciate the interest that was shown by van den Berg and Jongsma in our recent publication regarding the effects of maternal FiO₂ on fetal SpO₂ measured by reflectance pulse oximetry.

In our original article, repeated-measures analysis of variance was used to evaluate the short-term effects (group I, 20-minute duration, FiO₂ 21%, 40%, and 100%) and long-term effects (group II, 45-minute duration, FiO₂ 21% and 40%) of supplemental maternal oxygen administration on fetal SpO₂ in normal laboring women. According to van den Berg and Jongsma additional statistical analyses of the data reveal further observations and conclusions.

A matched t test was used to compare means of subgroups, with a two-tailed p < 0.05 considered significant. Spearman regression-correlation analysis was used to determine relationships between the initial fetal SpO₂ before oxygen therapy and percent change in fetal SpO₂ [(Initial SpO₂ - Final SpO₂) ÷ Initial SpO₂] × 100] after therapy in treatment subgroups, with