

ULTRASOUND PLACENTAL STUDY AND FETAL LUNG MATURITY

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SUMMARY

This study was undertaken to ascertain the usefulness of placental development ultrasound study in prediction of RDS.

We examined 96 women near term of pregnancy; the accuracy of placental maturity grades in predicting fetal lung maturity was compared with lecithin/sphingomyelin ratio and with clinical development of RDS in the infants.

We observed good correlation among ultrasound placental grades and fetal maturity.

This work has been presented at the International Symposium on "The Surfactant System of the Lung", Rome, March 2-4, 1983.

The incidence of neonatal respiratory distress syndrome (RDS) has decreased after the use of amniotic fluid tests for pulmonary fetal surfactants.

The most utilized test is the lecithin/sphingomyelin (L/S) ratio, performed by amniocentesis. The complications comprehend bleeding, premature labor, injury or death of the fetus.

Usually in obstetrics the ultrasound is utilized for the evaluation of fetal well-being. It may be practiced many times being a noninvasive technique for mother and fetus.

Winsberg⁽⁴⁾ and Fisher⁽¹⁾ refer that the ultrasound of the placenta is a potential marker of fetal development. They describe characteristic ultrasound patterns which occur in the maturing placenta.

On the basis of these findings, Granum⁽³⁾ proposed a grading system for placental maturity (from 0 to 3): (I) chorionic plate, (II) placental substance, (III) basal layer.

In a grade 0 the chorionic plate is smooth, the placental substance is homogeneous and the basal layer is equal to placental substance; in a grade I there are indentations in the chorionic plate, echogenic areas dispersed in placental substance and the basal layer is unchanged. In a grade II in the placenta there are marked indentations which do not reach the basal layer, the placental substance is divided by the commalike densities with the chorionic plate and the basal layer shows a linear arrangement of small echogenic areas. In a grade III the placenta consists of a plate which has indentations extended to the basal layer; the placental substance is divided in compartments with echospared areas. The basal layer contains dense and confluent echogenic areas.

The present study was undertaken to assess placental maturity with real time ultrasound and correlate it with fetal lung maturity.

MATERIAL AND METHODS

We examined 96 women near term of pregnancy; we evaluated the real time ultrasound determination of placental grading and correlated it to the fetal lung profile.

The amniocentesis was performed at the time of the ultrasound examination; the fetal pulmonary maturity was measured by the L/S ratio and by absence of RDS in the infants.

RESULTS

Among 36 pregnant women examined, we found 37 cases of placental grade I, 40 were grade II and 19 were grade III (table 1).

Table 1 A. — *Ultrasound placental study and fetal lung maturity.*

Placental maturity (grades)	No.	L/S < 2	RDS (present)
I	37	5	3
II	40	2	0
III	19	0	0

Table 1 B. — *Ultrasound placental study and fetal lung maturity.*

Placental maturity (grades)	No.	L/S > 2	RDS (present)
I	40	32	0
II	40	38	0
III	19	19	0

Of the 37 women with a grade I, 5 had an L/S ratio lesser than 2 and 32 patients had an L/S ratio greater than 2.

Of the 40 women with a grade II, 2 had an L/S ratio lesser than 2 and 38 patients had an L/S ratio greater than 2.

Of the 19 women with a grade III, all patients had an L/S ratio greater than 2.

The respiratory distress syndrome developed only in 3 of 5 infants with placental grade I and L/S ratio lesser than 2.

DISCUSSION

In this study, we correlated ultrasound placental grades with L/S ratio as predictor of fetal pulmonary maturity. In our pregnant women, we found a 100% correlation of mature L/S ratio with grade III of placenta. The grade II of placenta correlated with mature L/S ratio in 95% of the cases. A grade I of placenta correlated with mature L/S ratio in 86.4% of the cases.

The development of the respiratory distress syndrome in the infants was observed only in the grade I of placenta.

Usually the amniocentesis is utilized for predicting fetal pulmonary maturity⁽²⁾. But this examination is not devoid of risks of its invasive nature, and in some cases it's not possible or successful as in women with premature rupture of membranes or oligohydramnios. The evaluation of placental grades in these women is useful to assess lung maturity and in determining the course of management of the pregnancy.

We also believe that the determination of lung maturity by amniotic fluid analysis is the standard procedure in cases of uncertain fetal maturity prior to elective delivery, but in some cases, in which the amniocentesis is not possible, the ultrasound examination of placental development is useful for the evaluation of fetal maturity, being a simple, rapid and non invasive method.

REFERENCES

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