

# **RAPID TEST ON AMNIOTIC FLUID FOR DIAGNOSIS OF FOETAL PULMONARY MATURITY**

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The amniotic fluid, being directly or indirectly involved in the metabolic processes of the foeto-placental unit through the modifications of its various contents, is an extremely useful source of information about foetal maturity.

Table 1 shows the main elements normally constituting the amniotic fluid. Their quantitative analysis allows the assessment of the degree of maturity of many foetal organs and, indirectly, of the whole foetus.

However, the use of these indexes of foetal development is very limited because of often unsuitable dosage methods and laboratory equipments, that cannot easily be found in all assistance centers.

Undoubtedly, the lecithin/sphingomyelin ratio is the most widely used test of foetal pulmonary maturity. It is based on the assumption that lecithin and sphingomyelin increase simultaneously and at the same rate until the 34th week of gestation.

Subsequently lecithin increases prevalently and at a rapid rate.

As a matter of fact, the risk of neonatal respiratory syndrome significantly decreases when the L/S ratio is  $\geq 2$ , which usually happens after the 34th or 35th week of pregnancy.

Therefore it could be interesting to perform other possible tests to assess lung development.

A comparison of all these tests might be useful to obtain more accurate diagnoses.

Recently many Authors have reported the results of studies comparing optic density at 650 nm and L/S ratio in the amniotic fluid.

Spectrophotometric examinations at 650 nm of many samples of A.F., between the 28th and the 38th gestational week, in 98% of the cases showed an optic density  $\geq 0.15$  in correlation with L/S ratio  $\geq 2.0$ .

The most interesting aspect of this method is the opportunity of reducing the

## **SUMMARY**

The Authors have carried out a study on samples of amniotic fluid taken at various gestational ages.

They compare the optic density at 650 nm and the Lecithin/Sphingomyelin ratio, evaluated from the quantitative point of view according to the method of Gluk and Coll.

The results show a significant correlation between samples with optic density  $\geq 0.15$  and those with L/S ratio  $\geq 2.0$ .

Finally, the Authors analyze the possible usefulness of this method as a rapid test to assess foetal pulmonary maturity.

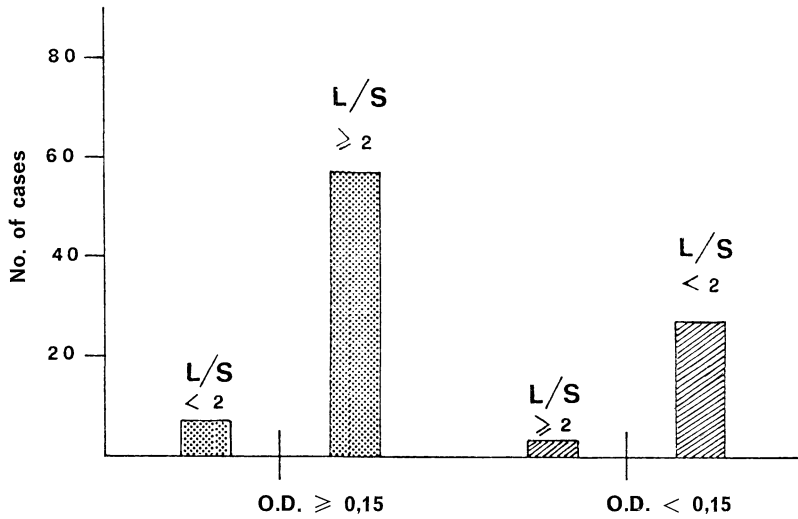


Fig. 1.

need for technical laboratory staff, who is not available 24 hs a day.

It is self-evident that a simple and rapid method to assess potential foetal risks is extremely useful when labor has already started or must be induced on

the basis of information about mother's conditions.

This study examines the use of a recently suggested test to assess its validity, both objectively and in comparison with the results of other tests.

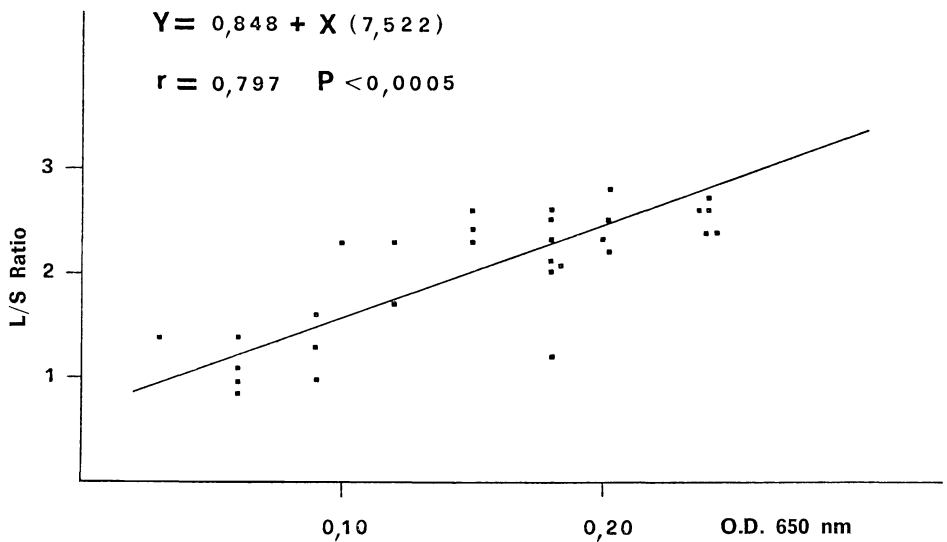


Table 1.

- |                                  |
|----------------------------------|
| 1) Proteins                      |
| 2) Creatinine                    |
| 3) Uric acid                     |
| 4) Urea                          |
| 5) Glucose, pyruvate and lactate |
| 6) Bilirubin                     |
| 7) Lipids                        |
| 8) Steroid and proteic hormones  |

## MATERIAL AND METHODS

Amniotic fluid samples were taken from 92 patients hospitalized at the Obstetric and Gynecologic Clinic of Perugia for various reasons, such as threatened premature delivery due to isthmo-cervical incompetence, hypertension, diabetes, placental insufficiency or voluntary interruption of pregnancy. On a diabetic patient, amniocentesis, repeated after two weeks, showed an increase from 1.6 to 2.5 in the L/S ratio.

Samples were centrifuged at 3200 rpm, for 10', in a refrigerated centrifuge, at 4 °C, within 1 hour from their drawing.

Two ml of the floating matter was subjected to spectrophotometric analysis at 650 nm against distilled water. On one ml the Authors measured the L/S ratio with the method of Gluk and Coll.

Obviously, samples containing meconium, blood or bilirubin were excluded.

## RESULTS

Table 2 and fig. 1 show the results obtained from 93 samples of amniotic fluid, taken between the 12th week and the end of pregnancy.

In 63 samples, optic density at 650 nm was  $\geq 0.15$ ; the L/S ratio was  $\geq 2.0$  in 57 cases, accounting for 90.4%. The re-

maining 30 samples showed an optic density  $< 0.15$ , with an L/S ratio  $< 2.0$  in 27 cases, accounting for 90% of the total.

## DISCUSSION

This study shows that in 90% of amniotic fluid samples the optical density at 650 nm  $\geq 0.15$  was matched with an L/S ratio  $\geq 2.0$ . The same correlation was found in samples with optical density  $< 0.15$  and L/S ratio  $< 2.0$ .

Statistical data processing (fig. 2) gave a correlation coefficient of  $r = 0.797$  and  $p < 0.0005$ .

Results so far reported, though limited in number, are in line with those reported by some Authors (7) and suggest the usefulness of further studies to verify the validity of this method.

An eventual confirmation of the first favourable impression, would undoubtedly allow this kind of examinations to be significantly streamlined.

In conclusion, if the results of the studies so far carried out were definitely confirmed, the suggested method would have an important and useful practical influence both on the approach to assistance and in cases of premature delivery. As a matter of fact neonatologists could have early information about potential foeto-neonatal risks, or decide on the advisability of adopting the most effective measures in using the tocolithic therapy, to limit the appearance of dangerous uterine kinetic activity.

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Table 2.

Tot. No. cases	O.D.	L/S	
93	650 nm	$< 2.0$	$\geq 2.0$
30	$< 0.15$	27	3
63	$\geq 0.15$	6	57

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