

# **ACCELERATIONS IN « INTRA-PARTUM » CARDIOTOCOGRAPHIC RECORD**

## **III. Correlation with meconium staining of amniotic fluid**

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The favourable prognostic significance of accelerations in "antepartum" cardiotocographic records has already been widely acknowledged. Recently, accelerations in "intra-partum" cardiotocographic records too <sup>(1, 2, 3, 7)</sup> have been recognized as important indicators of fetal reactivity and well-being.

This reaction is closely related to neonatal conditions, though other changes in the cardiotocogram may also be present (variable or late decelerations, flat record).

The presence of accelerations is particularly useful in case of suspected fetal distress as it helps to reduce the frequency of hurried extractions of the fetus.

Therefore, we studied the possibility of relying on this indicator in a group of patients showing meconium staining of amniotic fluid in labor.

The presence of meconium in the amniotic fluid is regarded by obstetricians as alarming for the fetus' conditions.

Though it is not a clear indicator of fetal distress <sup>(4)</sup>, it is associated with a high perinatal mortality rate, in some cases up to 8.8% <sup>(5)</sup> and even 32% when changes in FCF are also present <sup>(6)</sup>.

It is therefore clear that the availability of a reliable indicator of fetal well-being is extremely useful in these cases.

## **MATERIAL AND METHODS**

This study was carried out on the latest 2560 cases of deliveries (single pregnancy) at the 5th Obstetric and Gynecological Clinic of Milan University, for which at least a 30 minute clearly evaluable record concerning the first stage of labor was available.

The expulsion period was excluded on the basis of FCF progress and tocographic records, showing the typical spikes caused by expulsion contractions.

Over the examined period there were 2909 deliveries, 2560 (8.8%) of which were monitored.

In 253 of 2560 cases (9.9%) meconium staining of amniotic fluid was detected before the beginning of the expulsion period.

No distinction was made between cases with pultaceous, slightly or intensely stained fluid, because no difference in perinatal outcome be-

## **SUMMARY**

The Authors examined perinatal outcome and presence of accelerations in cardiotocographic records in a group of patients showing meconium staining of amniotic fluid in labor, in comparison with the data of a control group.

The first group showed an average Apgar between 1' and 5' and an average number of accelerations every 30' significantly lower than those of the control group.

Moreover the study of accelerations confirmed that an average of more than 5 accelerations every 30' is a clear indicator of fetal well-being.

Table 1. — Comparison between the average number of accelerations in 30' and the average Apgar between 1' and 5', in the meconium-stained fluid group and control group.

	No. cases	Av. accelerations	D.S.	Av. Apgar	D.S.
Stained fluid . . . . .	253	3.54	2.60	8.76	1.51
Control . . . . .	253	4.02	2.23	9.31	0.86
			p<0.05	p<0.001	

tween the three groups is reported in literature (8,9).

In the 253 examined cases and in further 253 control cases chosen at random among patients showing no meconium staining of amniotic fluid, both periodical and sporadic accelerations were recorded.

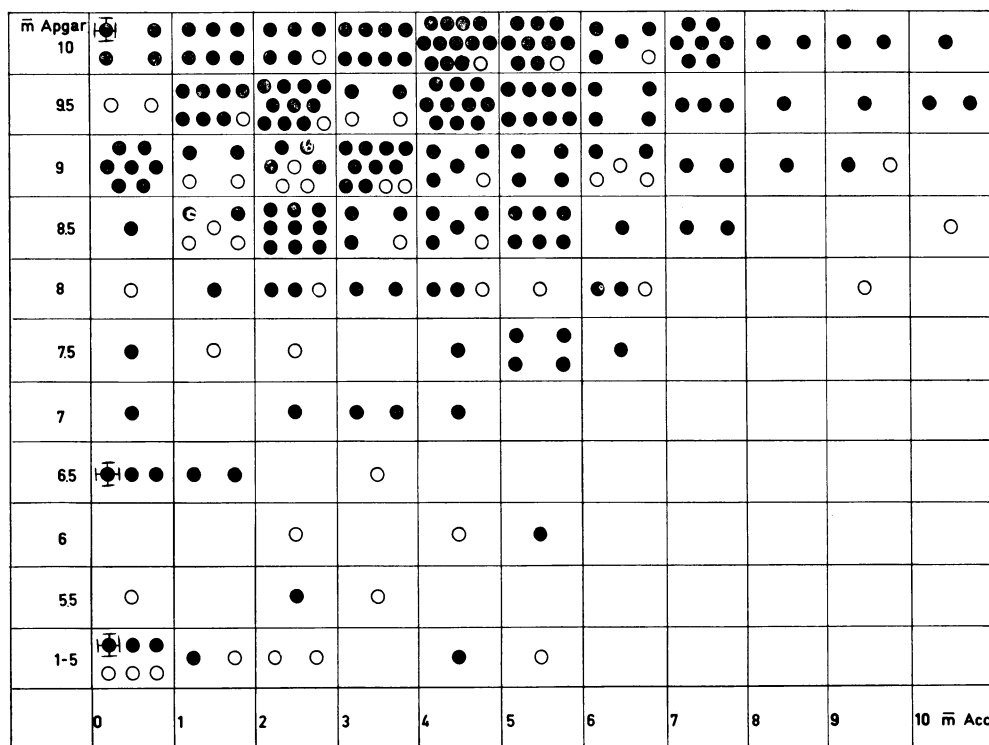
By acceleration it was meant a sudden FCF rise of at least the same amplitude as the oscil-

lations in that segment of the record, lasting at least 30".

We calculated the average number of accelerations for every 30' of record

$$\left( \frac{\text{total number of accelerations} \times 2}{\text{record length in hours}} \right)$$

proceeding backwards from the end of the dilatation period.



Legend: ●: eutocic deliveries; ○: dystocic deliveries; X: perinatal deaths.

Fig. 1. — Division of cases showing meconium staining of amniotic liquid, according to average Apgar between 1' and 5' and average number of accelerations in 30'.

Table 2. — Comparison of perinatal outcome between groups of records divided according to the average number of accelerations in 30'. By favourable or unfavourable outcome it is meant the presence of a higher and equal or lower than 7 Apgar average, respectively. The significance concerns the comparison between the number of unfavourable outcomes in groups with a number of accelerations lower than or equal to a whole number, and groups with a higher number of accelerations.

Av. accelerations	0	1	2	3	4	5	6	7	8	9	10
No. favourable outcomes . . .	17	25	38	31	38	33	19	14	4	6	4
No. unfavourable outcomes . . .	10	4	4	2	2	2	0	0	0	0	0
p < . . . . .	0.001	0.001	0.001	0.01		0.05	0.05	n.s.	n.s.	n.s.	n.s.
% unfavourable outcomes . . .	37.0	13.8	9.5	6.1	5.0	5.7	0	0	0	0	0

## RESULTS

The average Apgar between 1' and 5' and the number of accelerations/30' were significantly lower (8.76 against 9.31,  $p < 0.001$  and 3.54 against 4.02,  $p < 0.05$  respectively) in patients showing meconium staining of amniotic fluid than in the control group (tab. 1).

The correlation between the average of accelerations and the average Apgar between 1' and 5' in the stained-fluid group (fig. 1) shows the absence of unfavourable neonatal outcome (average Apgar  $< 7$ ) in cases with an average number of accelerations higher than 5.

The only 3 perinatal death (1.4%) occurred in cases with average accelerations = 0.

Statistics (fig. 1), obtained by dividing patients into eleven groups according to their average number of accelerations in 30' (tab. 2), show a progressive decrease in unfavourable outcome percentages (calculated on an average Apgar  $< 7$ ) to 5.6%, with an average number of accelerations higher than 2, and 0% with an average higher than 5.

If groups showing an average number of accelerations lower than or equal to a whole number are compared with those with a higher average, the results are equally significant.

## DISCUSSION

In the cases examined, the presence of meconium staining of amniotic fluid in labor was not associated with a high perinatal mortality rate.

However, in agreement with data recently published in the literature<sup>(8)</sup>, average Apgar and number of accelerations were significantly lower than in the control group.

The close relation between accelerations, neonatal outcome and fetal well-being has been confirmed.

Furthermore, in agreement with the results of our previous studies<sup>(2,3)</sup>, the data concerning this group of cases confirm that the presence of more than 5 accelerations every 30' can be regarded by obstetricians as an absolutely reassuring indicator. Therefore any intervention of early fetus extraction, on grounds of suspected fetal distress, is unjustified.

This indicator is particularly useful from the clinic point of view in cases of high-risk fetal conditions, such as meconium staining of amniotic fluid.

However, the outcome of this study suggests that, like in "ante-partum" cardiotocography, even the presence of only 2 accelerations every 30' may be sufficient as favourable prognostic indicator.

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