

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

## **IV. Correlation with the presence of a funiculus pathology**

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## **INTRODUCTION**

According to many Authors, variable decelerations and accelerations (at least periodical ones) in "intra-partum" cardiotocographic records indicate compression of the funiculus umbilicalis <sup>(1, 2, 3, 4, 5)</sup>.

These two patterns often appear simultaneously in the same record and sometimes even join together producing a single form of alteration, combined accelerations.

In a previous work <sup>(6)</sup> we highlighted the favourable prognostic significance of accelerations in intra-partum cardiotocographic record both with and without other patterns, commonly interpreted as indicating fetal distress. We noticed that, with more than 5 accelerations every 30' on the average, no unfavourable neonatal outcome (mortality or average Apgar between 1' and 5' < 7) occurred when the record showed variable decelerations.

In this study we have pursued two aims:

- determining the frequency of association of funiculus pathology with accelerations and variable decelerations in labor, in our cases;
- assessing the influence of the number of accelerations on neonatal outcomes in cases showing funiculus pathology and variable decelerations.

## **MATERIAL AND METHODS**

This study was carried out on 625 cases that, at the time of delivery, showed an umbilical cord pathology (funiculus winding and/or slung over the neck and/or real knots).

A control group of 625 cases was chosen at random among patients showing no funiculus pathology.

For all cases of both groups, at least a 30 minute clear cardiotocographic record was available before the beginning of the expulsion period.

These cases were chosen among the latest 2909 single pregnancy deliveries occurred at the Vth Obstetric and Gynecological Clinic of Milan University, at the 30.III.1980, 2650 of which (88%) were monitored.

1250 records showed both sporadic and periodic accelerations, that is sudden FCF rises of at least the same amplitude as the oscillations

## **SUMMARY**

The Authors compare the presence of accelerations and variable decelerations in a group of cases showing funiculus anomalies and in a control group.

The group with funiculus pathologies showed a lower average frequency of accelerations and a higher frequency of variable decelerations than the control group.

Furthermore, it was confirmed that an average of more than 5 accelerations is a clear indicator of fetal well-being.

Table 1. — Comparison between the average number of accelerations in 30' and the number of record with at least 5 variable decelerations every 30', in the group showing funiculus pathology and in the control group.

	No. cases	Av. accelerations	S.D.	No. records with var. dec.	
Funiculus pathology . . . . .	625	3.86	2.37	113	18.08
Control . . . . .	625	4.16	2.25	84	13.44
		p<0.05		p<0.05	

in that part of the record, lasting at least 30 seconds.

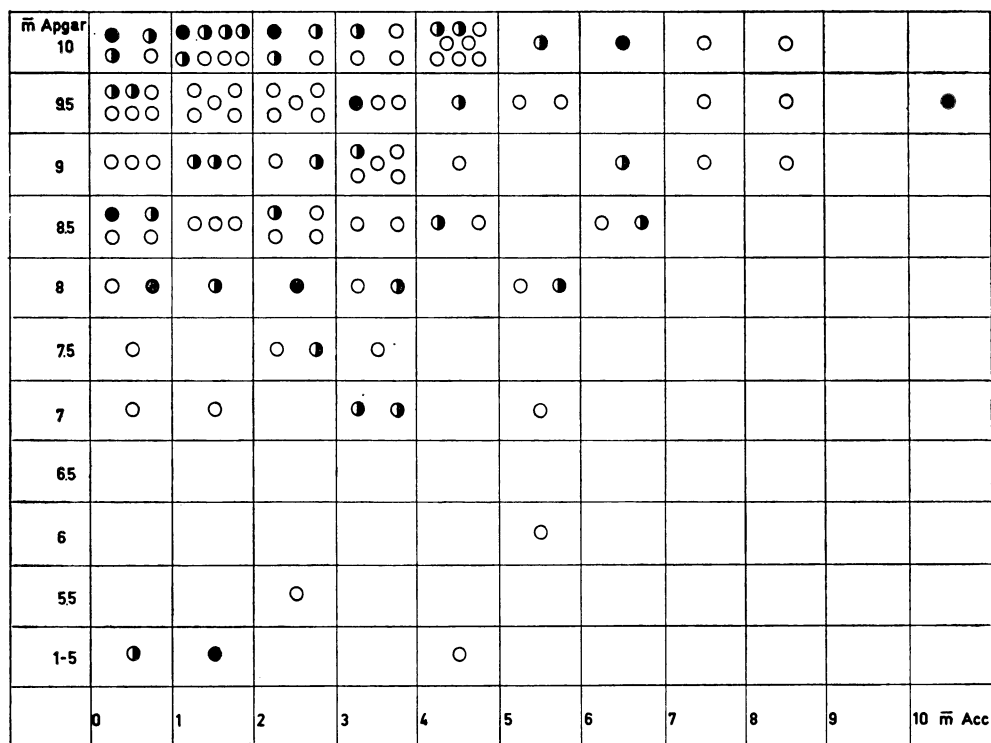
We calculated the average number of accelerations in every 30' record

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

proceeding backwards from the end of the dilatation period.

The expulsion period record was excluded on the bases of both the FCF progress and the tocographic record showing the typical spikes caused by expulsion contractions.

Furthermore, we studied the presence of variable FCF decelerations. These decelerations were defined as slight, moderate or serious, on the bases of the most frequent kind appearing in the record.



Legend: ○: slight variable decelerations; ◐: moderate variable decelerations; ●: serious variable decelerations.

Fig. 1. — Distinction of cases under examination, presenting records with variable decelerations, according to the average Apgar between 1' and 5' and the average number of accelerations in 30'.

## RESULTS

Fetus presenting a funiculus pathology at the time of delivery (625 out of 2560, or 24.4%) showed a lower average frequency of accelerations (3.86 against 4.16,  $p < 0.05$ ) and a higher frequency of variable decelerations (113, or 18.08% against 84, or 13.44%,  $p < 0.05$ ) than the control group (tab. 1).

Among the 113 cases showing funiculus pathology and varying decelerations there was no case of neonatal mortality or average Apgar between 1' and 5'  $< 8.5$ , when the average number of accelerations was higher than 5 every 30' (fig. 1).

## DISCUSSION

Data concerning the frequency of the two examined cardiotocographic patterns in fetus presenting funiculus pathologies show:

- that accelerations, taken on the whole as periodic and sporadic ones, have no casual relation with those pathologies. The decrease in the average number of accelerations in fetus presenting pathologies, is probably to be ascribed to unfavourable metabolic repercussions on the fetus due to the recurring compression of the funiculus;

- that variable decelerations, though significantly more frequent in fetus affected by funiculus pathologies than in those of the control group, are not pathognomonic of those pathologies, as they appear in less than 20% of the cases.

On the whole, it is confirmed that accelerations are useful indicators to assess fetal conditions.

In the examined group, the appearance of serious and variable decelerations caused by compression of the funiculus can lead the obstetrician to diagnose a fetal distress demanding immediate extraction of the fetus, but the simultaneous presence of accelerations must be regarded as showing continuing fetal reactivity.

Particularly, an average of more than 5 accelerations every 30' has always been associated with favourable neonatal outcomes.

Therefore, in agreement with the results of previous studies (<sup>6, 7, 8</sup>), the limit of 5 accelerations every 30' has been extremely significant for this group of cases too.

A higher number of accelerations must always be regarded as a clear indicator of fetal well-being, thus suppressing all reasons for any intervention of fetal extraction on grounds of suspected fetal distress.

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