

ACCELERATIONS IN « INTRA-PARTUM » CARDIOTOCOGRAPHIC RECORDING

II. Present contemporaneously to prognostically unfavourable cardiotocographic aspects

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INTRODUCTION

The clinical usefulness of biophysics monitoring during labour is nowadays undiscussed. Recently, we have however been witness to a reexamination of the recording interpretation criteria and in particular, to a getting over the schematism in pointing out the presence of single classic "patterns", for a more global evaluation based on the examination of more "patterns" present contemporaneously in the recording (^{1, 2}).

We therefore wanted to verify the significance of the presence of accelerations, whose value of foetal well-being index is pointed out by the comparison with the perinatal outcome (³), contemporaneously to other cardiotocographic "patterns".

In particular, we have examined the significance of the presence of accelerations combined with variable decelerations, which is still the cardiotocographic parameter of more dubious interpretation.

We also wanted to verify the usefulness of "a posteriori" evaluation of the acceleratory activity in case of obstetric operations conducted for foetal distress on the basis of data provided by the cardiotocogram.

MATERIAL AND METHODS

Our study has been conducted on 1994 "intrapartum" cardiotocograms recorded in the period 22-IX-1975/23-IV-1979 pertinent to single pregnancies. Out of them 1742 presented at least half hour of recording evaluable before the beginning of the second stage of labour. The Apgar score at birth was lacking in 34 cases. The lecture has therefore concerned 1708 recordings from their start up to the beginning of the second stage of labour. Each one of them has been subdivided in many half hours, starting from the end of the first stage of labour, up to a maximum of 16 half hours. The number of both sporadic and periodic accelerations, and the presence of the following FHR variations has been evaluated for each single half hour:

- *Bradycardia* = FHR <120 for at least 10'.
- *Tachycardia* = FHR >180 for at least 30'.
- *Loss of cyclic variations* = amplitude of cyclic

SUMMARY

The Authors examine 1994 cardiotocographic recordings during labour, equivalent to 89% of all deliveries of the same period.

They evaluate the acceleratory activity in the tract of recording presenting alterations considered expression of foetal distress (bradycardia, severe tachycardia, loss of cyclic variations, variable and late decelerations), and compare both parameters with the perinatal outcome.

The presence of accelerations seems to allow a more oculte evaluation of the cardiotocogram and, in particular, a decreased incidence of hurried instrumental foetal extractions.

- variations <5 b.p.m. (in absence of drugs administration during the two previous hours).
- *Late decelerations* = (at least 5 in 30')
 - i) slight = amplitude <15 b.p.m.
 - ii) moderate = amplitude between 15 and 45 b.p.m.
 - iii) severe = amplitude >45 b.p.m.
 - *Variable decelerations* = (when present for the whole 30')
 - Pre-deceleration acceleration
 - Post-deceleration acceleration
 - Pre+post deceleration acceleration
 - *Sporadic decelerations*
 - i) "vertically" = lenght <30"
 - ii) "intermediate" = lenght between 30" and 2'
 - iii) "prolonged" = lenght between 2' and 10'.
- It has been calculated the number of accele-

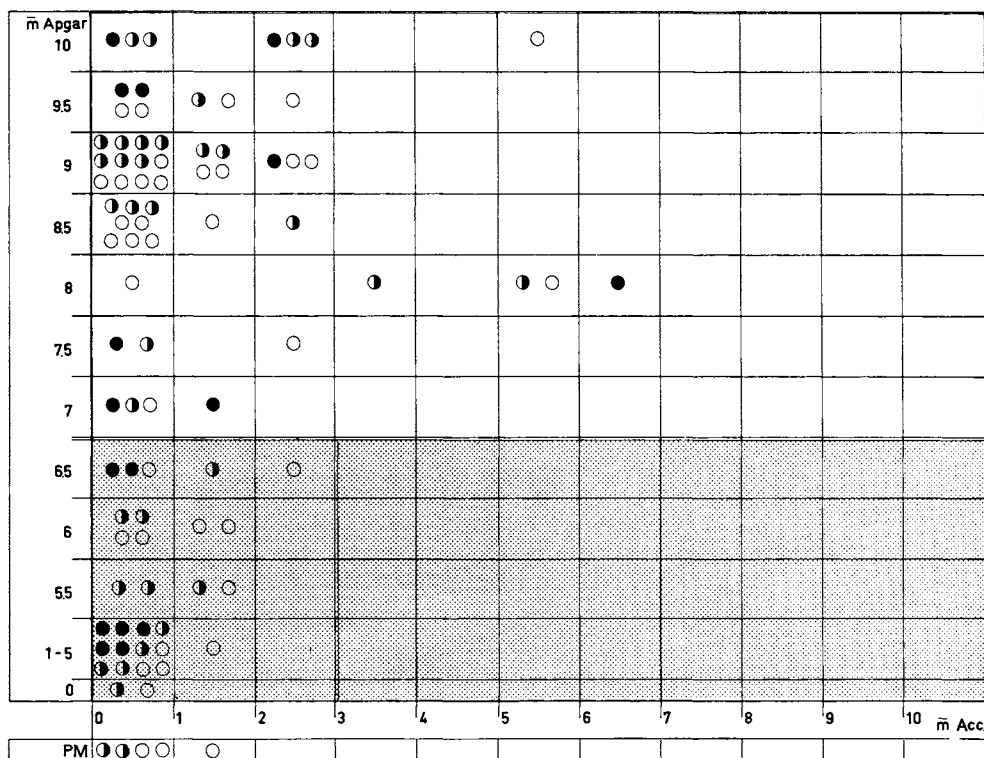


Fig. 1. — Distribution of the cases presenting late decelerations in relation to the average Apgar between 1' and 5'. The cases examined have been subdivided according to the average number of accelerations present during the 30' in which such alterations appeared.

Legenda: ○, slight late decelerations; ◐, moderate; ●, severe; PM, perinatal mortality.

- i) slight = with acme >80 b.p.m. and lenght <60"
- ii) moderate = with acme >70 b.p.m. and lenght >60", or with acme <70 b.p.m. and lenght <60"
- iii) severe = with acme <70 b.p.m. and lenght >60".

For the variable decelerations it has also been evaluated the presence of the following signs:

rations present in the same half hour in which one of the above FHR alterations has showed.

In case a single alteration was present in several half hours, it has been calculated the average number of accelerations in the interested half hours.

The perinatal outcome has been evaluated by the perinatal mortality and by the Apgar score (1' and 5') data, that was systematically surveyed at birth by the pediatrician.

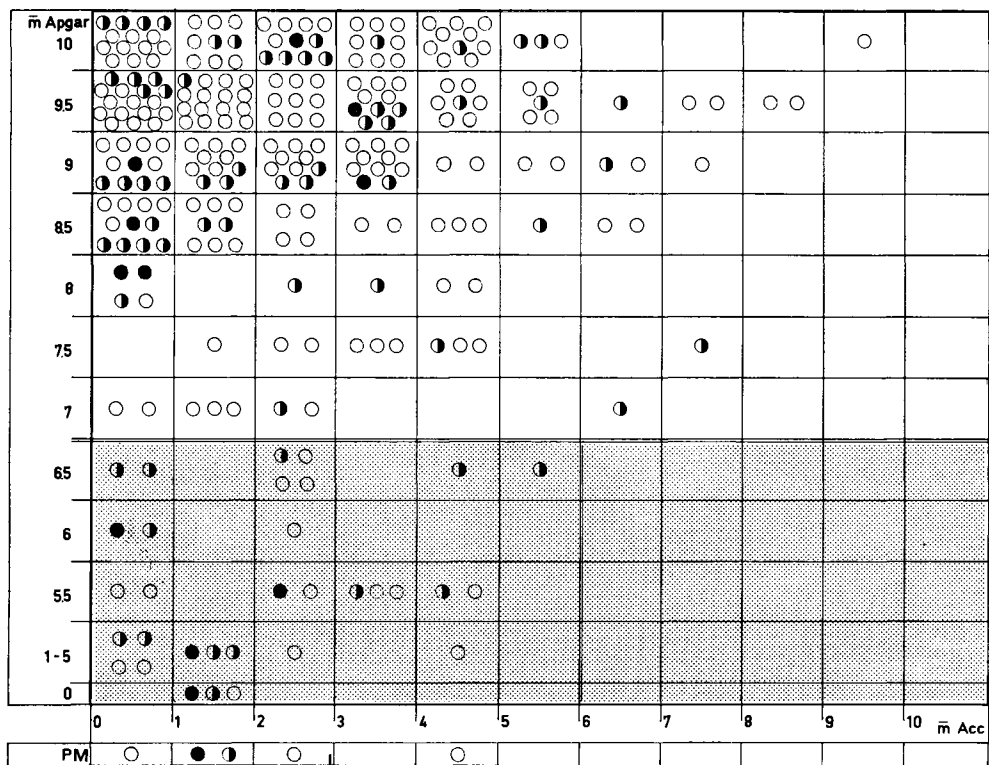


Fig. 2. — Distribution in relation to the average Apgar between 1' and 5' of the cases presenting variable decelerations. The examined cases have been subdivided according to the average number of accelerations present in the 30' during which such alterations appeared.

Legenda: ○, slight variable decelerations; ◐, moderate; ●, severe; PM, perinatal mortality.

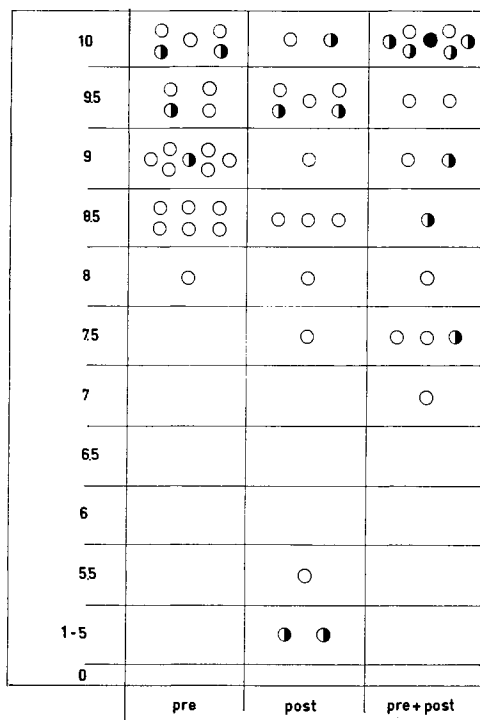


Fig. 3. — Distribution in relation to the average Apgar between 1' and 5' of the cases presenting variable decelerations combined with pre and/or post deceleration accelerations. The examined cases have been subdivided according to the average number of accelerations present during the 30' in which such patterns were observed.

Legenda: pre, variable decelerations preceded by an acceleration; post, variable decelerations followed by an acceleration; pre+post, variable decelerations presenting a pre and a post deceleration acceleration.

RESULTS

Late decelerations are accompanied by a low frequency of accelerations (fig. 1).

No case has an average number of accelerations above 6 and only 5 have it above 2:

tation of cardiotocography during labour. Variables, even if slight, are in fact quite often accompanied by an unfavourable outcome (fig. 2), but this is proved to be absent in cases with an average of more than 5 accelerations every 30'.

We have examined apart a group of

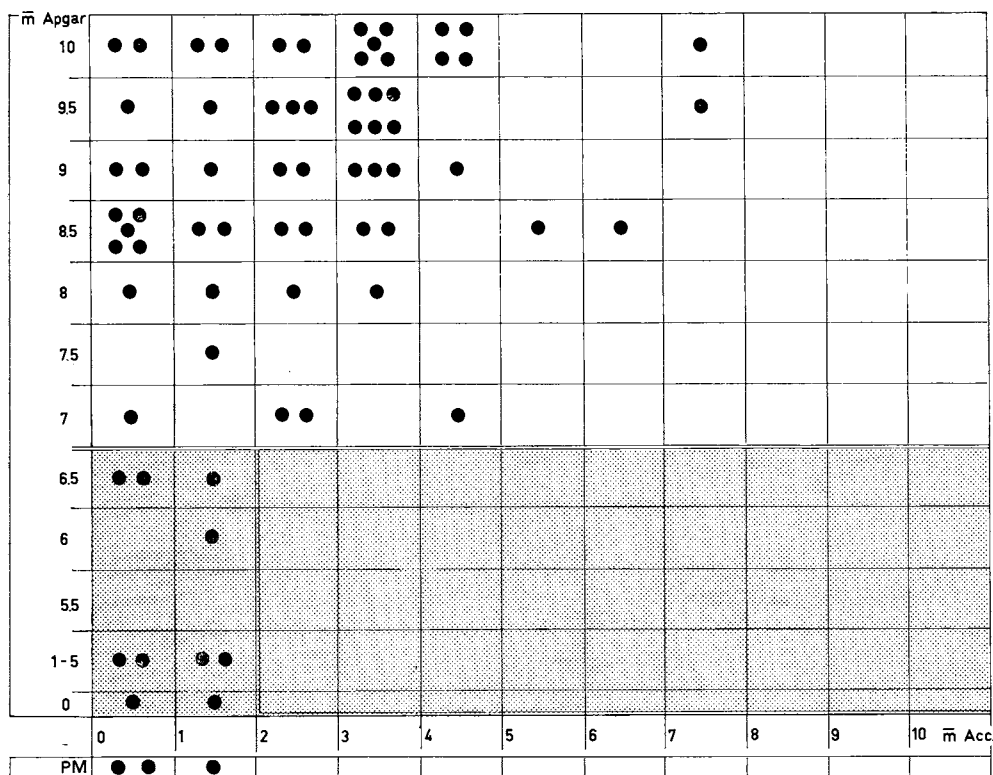


Fig. 4. — Distribution in relation to the average Apgar between 1' and 5' of the cases presenting and amplitude of cyclic variations < 5 b.p.m. The examined cases have been subdivided according to the average number of accelerations present during the 30' in which such alterations appeared.

Legenda: PM, perinatal mortality.

all these 5 cases have an average Apgar > 8. Even the presence of slight late decelerations, especially if associated to less than 2 accelerations in 30', results correlated to unfavourable perinatal outcome.

Variable decelerations are proved to be the parameter of more dubious interpre-

recordings (56 cases) in which variables were combined with pre, post and pre+post deceleration accelerations.

Presence of pre-deceleration acceleration seems to have a more unfavourable prognostic significance than post-deceleration one (fig. 3).

In case of loss of cyclic variations, or of amplitude of cyclic variations < 5 , the presence of more than 1 acceleration every 30' is invariably correlated, in our study, to a favourable perinatal outcome (fig. 4).

among the unfavourable cases with sporadic prolonged and rarely intermediate decelerations are clearly predominant, while the «vertically» ones do not seem to have any unfavourable prognostic significance.

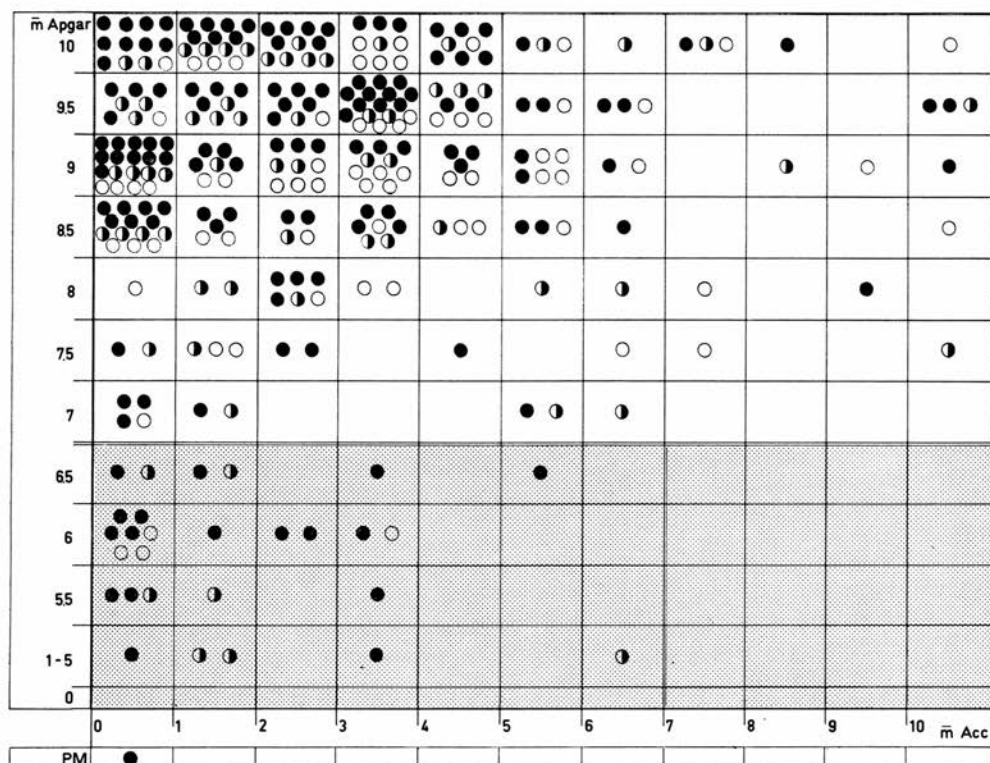


Fig. 5. — Distribution in relation to the average Apgar between 1' and 5' of the cases presenting sporadic decelerations. The examined cases have been subdivided according to the average number of accelerations present during the 30' in which such alterations appeared.

Legenda: O, «vertically» sporadic decelerations; ◐, intermediate; ●, prolonged; PM, perinatal mortality.

Sporadic decelerations represent an atypical but quite frequent aspect, which almost always worries and is of dubious interpretation.

Even in presence of this «pattern» an average number of at least 4 accelerations in 30' (fig. 5), has lead to an average Apgar < 7 ($= 6.5$) only once (5 accelerations/30'). It must be pointed out that

Data pertinent to severe tachycardia are not significative because of the too small number of cases (10 cases): all those with an average of more than 2 accelerations in 30' had however favourable outcome.

All the cases with bradycardia had a good outcome independently from the number of accelerations.

This datum is evidently to ascribe to the fact that a slight prolonged bradycardia in first stage of labour is related to a foetal physiologic characteristic.

Finally, the presence of accelerations seems significantly correlated to the perinatal outcome of all instrumental deli-

rage number of accelerations above 2 for 30', the newborns had an average Apgar between 1' and 5' ≥ 8 .

DISCUSSION

The examination of the results shows that the number of accelerations is reduced

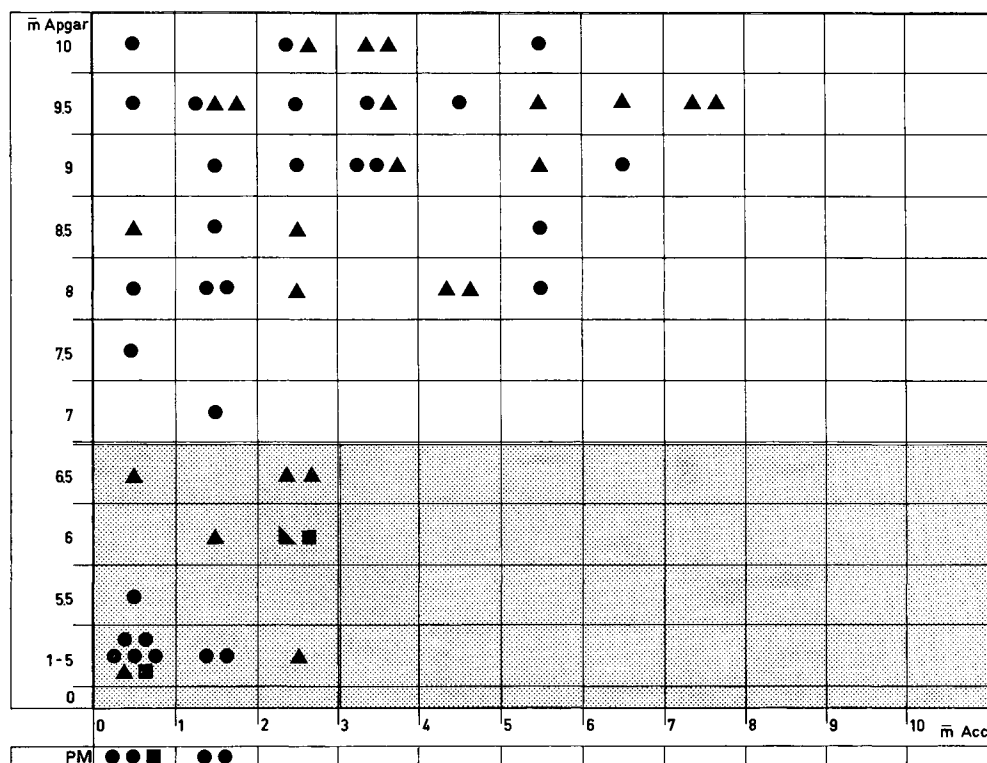


Fig. 6. — Distribution in relation to the average Apgar between 1' and 5' of the cases which have undergone an instrumental delivery for foetal distress, diagnosed on the basis of data provided only by the cardiotocographic recording. The cases in discussion have been subdivided according to the average number of accelerations present in 30'.

Legenda: ●, C.S.; ▲, V.E.; ▴, Forcep; ■, V.E. + Forcep; PM, perinatal mortality.

veries (C.S., V.E., forceps), in which the operation was made for foetal distress on the basis of cardiotocographic indications (fig. 6).

In all the 19 cases of instrumental deliveries carried out in presence of an ave-

in comparison with the general averages, in the half hours in which other patterns considered as indicative of a foetal distress, are present.

This tendency is particularly evident in presence of the parameter with more se-

vere significance, that is the presence of late decelerations, which were associated to more than two accelerations only in 5 cases (all with good outcome).

In presence of any other cardiotocographic sign of danger (variable decelerations, loss of cyclic variations, severe tachycardia, sporadic decelerations), no cases with contemporaneous presence of more than 6 accelerations had negative outcome.

This observation, is confirmed by the absence of negative outcome in the cases with variable decelerations preceded by an acceleration.

The significance, apparently less favourable, of accelerations appearing just after a deceleration is of difficult interpretation.

However our data, even if numerically reduced, confirm what Goodlin and Lowe have already observed (4).

Finally, data pertinent to immediate neonatologic outcome in cases of instrumental delivery for foetal distress, diagnosed by cardiotocography, are a clear clinical verification of the usefulness of pointing out the presence of accelerations in cases with unfavourable patterns.

Even if it would be right to subject all these newborns to long term neurologic controls, and in spite of the relative accuracy of the only reference parameter actually utilizable, that is the Apgar score, it does not seem negligible the observation that all the cases with more than 2 accelerations every 30' had and average Apgar ≥ 8 .

CONCLUSIONS

The observation of the presence of accelerations in « intra-partum » cardiotocographic recording, assumes a significance of foetal well-being either in presence of aspects considered as index of foetal distress, either in absence of other FHR alterations.

When cardiotocographic aspects considered expression of foetal danger appear, one must always evaluate carefully the presence of accelerations, either during the hours preceding the pattern appearance, either contemporaneously to it. In case during the preceding hours, a good acceleratory activity is present and in the examined period at least two are present every 30', one can more calmly evaluate the opportunity of an instrumental delivery.

The presence of accelerations preceding the descent phase, in case of even severe variable decelerations, seems sufficient to exclude the existence of a foetal distress.

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