

USEFULNESS OF CARDIOTOCOGRAPHY IN EXPULSION PERIOD

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Cardiotocography, that is the electronic recording of foetal heart beating and uterine contractility, has made a decisive contribution to the improvement of obstetric assistance and the reduction of perinatal morbidity and mortality.

However, despite its recognized usefulness, the cardiotocograph electrode is still very commonly removed from the foetus' head at the beginning of the expulsion period. Thus, the flow of information on the foetus' well-being is interrupted, despite the already recognized good correlation between cardiotocographic pictures in expulsion period and child's clinical and bio-humoral data ⁽¹⁾.

MATERIAL AND METHODS

We examined the cardiotocographic record of 196 patients' expulsion period, at the Obstetric and Gynecological Clinic of Padua University.

We gathered mother's and children's most significant data to compare them with the various kinds of cardiotocographic records previously obtained. These data were evaluated on the basis of classifications suggested by Fischer ⁽²⁾, Melchior ⁽³⁾ and Thierj ⁽⁴⁾.

DISCUSSION

In table 1 records are divided according to the different classifications.

Melchior's type 0, Fischer's FCF 1 picture and Thierj's type 1, corresponding to normocardic records, were found in 17.8%, 20.4% and 39.2% of cases respectively.

Fischer's FCF 2 picture and Melchior's type 1, presenting variable decelerations, particularly accompanying uterine contractions, account for 41.8% and 39.7% of our cases, respectively.

With regard to Melchior's types 2, 3, 4, Fischer's FCF 3 picture and Thierj's types 2 and 4, presenting final bradycardia during the period of effort, our data are in line with those reported by the above mentioned Authors. These pictures appear in more than one third of the cases and demand maximum control.

SUMMARY

When an expulsion-period cardiotocographic record is examined, the most important factors, to be carefully controlled, are foetal cardiac frequency, its irregularities, the presence of decelerations and, above all, the appearance of final bradycardia.

The Authors have studied 196 cardiotocographic records taken in expulsion period.

Apart from the above mentioned factors, they looked for correlations between pathological pictures and parity, length of expulsion period and Apgar score.

Satisfactory results lead them to conclude that cardiotocography is indispensable also in expulsion period.

Table 1. — *Classification of records.*

Fischer			Melchior			Thierj		
Type	No. cases	%	Type	No. cases	%	Type	No. cases	%
1	40	20.40	0	35	17.85	I	77	39.28
2	82	41.83	1	78	39.79	II	71	36.22
3	62	31.63	2	55	28.06	III	13	6.63
4	2	1.02	3	11	5.61	IV	18	9.18
5	7	3.57	4	17	8.67	V	17	8.67
6	3	1.53						
Total 196								

On the other hand, tachycardia and/or accelerations accompanying contraction in expulsion period, are not frequent (pictures: Fischer's FCF 4, 5, 6, Thierj's 5). The same applies to Thierj's type 3, presenting temporary bradycardia.

Table 2 shows a distinction of parity according to record types.

It appears that records without alterations (Melchior's type 0) and those with decelerations (Melchior's type 1) are almost equally frequent in primiparae and pluriparae.

Conversely, records showing bradycardia (Melchior's types 2, 3, 4) are more frequent in primiparae than in pluriparae, probably owing to the different length of the expulsion period, which lasts longer in primiparae (table 3).

Table 2. — *Distribution of parity according to record type.*

Type	No. cases	Primipare		Multipare	
		No. cases	%	No. cases	%
0	40	18	45	22	55
1	89	43	48.31	46	51.68
2	41	30	73.17	11	26.82
3	10	7	70	3	30
4	16	9	56.25	7	43.75
Total 196					

Bearing this in mind, Melchior (³) suggests that the second stage should not exceed a fixed time-limit.

Table 3. — *Correlation between duration of expulsion period and parity, in each type of record, in spontaneous delivery (according to Melchior's classification).*

Type	No. cases	Duration	Primipare		Multipare	
			No. cases	%	No. cases	%
0	40	Up to 10'	5	12.50	16	40.00
		Between 10' and 20'	8	20.00	3	7.50
		Over 20'	5	12.50	3	7.50
1	84	Up to 10'	14	16.66	21	25.00
		Between 10' and 20'	11	13.09	19	22.61
		Over 20'	14	16.66	5	5.95
2	38	Up to 10'	6	15.78	5	13.15
		Between 10' and 20'	13	34.21	4	10.52
		Over 20'	8	21.05	2	5.26
3	10	Up to 10'	2	20.00	2	20.00
		Between 10' and 20'	2	20.00	1	10.00
		Over 20'	3	30.00	0	0
4	15	Up to 10'	2	13.33	6	40.00
		Between 10' and 20'	4	26.66	2	13.33
		Over 20'	1	6.66	0	0
Total 187						

Table 4. — FCF irregularities during the second stage (according to Hon's classification).

Oscillations	Type	No. cases	%
	Silent	2	1.02
	Limited undulatory	49	25.00
	Undulatory	123	62.75
	Jumping	22	11.22

Total 196

Table 5. — Correlation between Apgar score at 1' and parity in each type of record (according to Melchior's classification).

Type of record	Primipare		Multipare	
	Apgar at 1'	No. cases	Apgar at 1'	No. cases
0	≤7	0	≤7	0
	>7	18	>7	22
1	≤7	2	≤7	2
	>7	41	>7	44
2	≤7	3	≤7	0
	>7	27	>7	11
3	≤7	0	≤7	0
	>7	7	>7	3
4	≤7	2	≤7	1
	>7	7	>7	6

Total 196

He has calculated the maximum duration of expulsion period compatible with neonatal well being, on the basis of the record type, thus concluding that delivery must occur within 15/20 minutes in type 1, but within 5 minutes in types 2, 3 and 4.

The foetus must be extracted even earlier if serious anomalies occur at the

end of the first stage, or unfavourable clinical factors are simultaneously present. One of them is decrease in reactivity, marked, in cardiotocographic records, by the appearance of oscillations of the silent type (table 4).

CONCLUSION

During the expulsion period, different FCF pictures can be observed.

The basal frequency level is as significant as the presence or absence of decelerations.

The appearance of final bradycardia, often associated with a low Apgar score in our cases (table 5), suggests the advisability of a very rapid conclusion of labor, at least within the three following pushes.

Therefore, foetal monitoring based on cardiac frequency recording, enables us to decide when urgent extraction is necessary or when the intervention would be too hasty.

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