CARDIOVASCULAR SYSTEM IN NEWBORNS FROM MULTIPLE PREGNANCY

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This work presents the results of clinical observations and ECG examinations in 45 newborns from multiple pregnancies, including 27 full-term and 13 premature newborns. In both groups cyanosis was observed, the second twin born prematurely being most often affected. Changes in ECG include bradycardia, which occurs in the first 24 hours of life and chiefly in children born with asphyxia. The same newborns showed a delayed evolution of T wave. The similarity of ECG was noticed in 5 MZ pairs.

Assessment of the adaptation of the circulatory system in multiple pregnancies is not easy, due to the rapid changes occurring in the conversion of fetal circulation into the nonfetal one. Furthermore, in multiple pregnancy, delivery is a greater stress for each subsequent child of this pregnancy (Adams et al. 1958, Jerzykowska-Kuleszyna and Zywicka-Twarowska 1964, Arustowicz 1966, Rogoza 1971*a*). The authors point out that axonograms and ECGs in MZ twins are similar in physiological deliveries, but different in difficult deliveries. The period of adaptation of these children is also different (Jagielski and Nolisowa 1965, Pedich 1965*b*).

In our Department of Obstetrics and Gynecology in Danzig we carried out clinical observations and electrographic examinations of newborns from 21 twin (10 MZ) and 1 triplet pregnancies, including 27 full-term (Group 1) and 18 premature infants (Group 2). Pregnancy history refers to a group of 3 mothers, of which one had pyelitis. Pathological deliveries concerned 13 children (3 vaginal deliveries and 3 Cesarean sections, including one triplet pregnancy).

In Group 1 the first twin born under asphyxia died in the second 24 hours of life. The neonatal period of the remaining children showed no complications. The Apgar test, performed in the 5th minute of life, scored over 8 points.

In Group 2 general conditions of 5 prematures (the second twins) were not satisfactory. Three of them died with symptoms of respiratory troubles and respiratory failure. One premature child had circulatory failure and one had pneumonia. The Apgar test, performed in the 5th minute of life, scored over 6 points.

RESULTS

Detailed Examination of the Circulatory System

The detailed examination of the circulatory system is based on the following criteria: inspection, palpation, auscultation, arterial pressure measurements, and ECG examinations in the 1st, 3rd, and 5-7th day of observation (Table).

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Table. *Occurrence of Symptoms in the First 24 Hours of Life in Newborns of Multiple Pregnancy*

	Full-term			Prematures	
	I	II	III	I	II
Peripheral cyanosis	—	2	—	3	5
Generalized cyanosis	1	—	—	—	3
Respiratory troubles	1	—	—	2	4
Liver enlargement	1	—	—	—	2
Disturbance of rhythm	1	3	—	4	9
Abnormal sounds	1	—	—	2	5
Murmurs	—	—	—	1	1
Systolic pressure below 60 mm Hg	—	—	—	1	4

In both groups severe cases showed a generalized cyanosis with associated respiratory troubles chiefly in prematures. The time period did not usually exceed the first 24 hours and sometimes was extended until the third 24 hours. Disorders of cardiac function occurred in the form of bradycardia, tachycardia, or variability of heart rhythm. Murmurs were heard in 2 prematures with heart defect (MZ twins). Dullness of heart sounds was definite in infants born in an unsatisfactory condition. Values of systolic pressure lower than 60 mm Hg were recorded in 5 newborns.

ECG Examination

The Figure shows the heart-rhythm curves for both groups. Higher mean values occur in Group 1. In both groups the greatest slowing down of heart rhythm was observed in the first 24 hours, with an acceleration until the last 24 hours of observation. In all children a sinus rhythm of wide range and variability was noticed. No other disorders of rhythm were observed. The slowing down of heart action was associated with the prolongation of Q-T. The voltage of P wave did not exceed 2.5 mm.

In both groups the angle α was contained in the dextrogram quadrant (from $+ 90$ to $+ 160^0$) with slightly lower values for prematures. In children born in unsatisfactory conditions the positive waves still persisted over the right ventricle in the last ECG recording. Similarity of ECG recordings was observed in 5 MZ twins.

DISCUSSION

From the results obtained it may be seen that cyanosis occurs more often in the group of premature infants and affects mainly the second twin. The general conditions of these children after delivery were not satisfactory. Values of systolic pressure below 60 mm Hg were found in these children. In all newborns, though mainly in those born in asphyxia, a sinus rhythm of variable range was observed, with bradycardia prevailing in the first

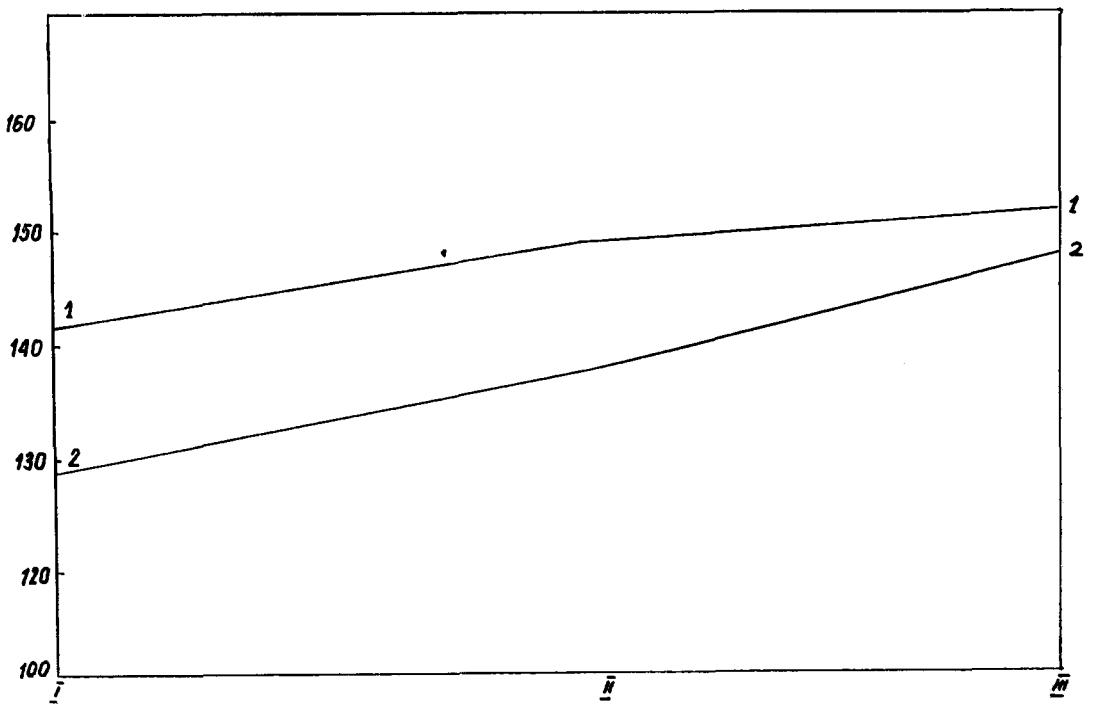

Fig. 1. Heart rhythm in groups 1 and 2 in the first three days of observation

24 hours of life. This is confirmed by other authors (Adams et al. 1958, Valbona et al. 1961, Jerzykowska-Kuleszyna and Zywicka-Twarowska 1964, Rogoza 1971*a*).
In children with respiratory troubles the so-called rigidity of rhythm, which was described in other works, was not observed (Usher 1961, Valbona et al. 1961, Rogoza 1971*b*). The R wave did not exceed 2.5 mm. The angle α was contained in the dextrogram quadrant. Delayed evolution of T wave was found in children born in asphyxia. Because of the similarity of the ECGs in only 5 pairs of MZ twins, the material was too scanty to statistically work out this problem as described by other authors (Jagielski and Nolisowa 1965, Pedich 1965*b*).

CONCLUSIONS

1. During the delivery of multiple pregnancy the second twin is under a greater stress, especially in the case of prematurity.
2. The changes in the circulatory system were found chiefly in prematures.
3. They were shown by the slowing down of the heart action in the first 24 hours of life, with the variability of rhythm and the delayed evolution of T wave.
4. Premature infants with respiratory troubles showed no " rigidity of the rhythm ".

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