RADIOTELEMETRIC INVESTIGATION OF FLUCTUATIONS IN INTRAUTERINE PRESSURE DURING INTERVALS BETWEEN LABOR PAINS

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Contractile activity of the uterus was studied by continuous radiotelemetry of the intrauterine pressure in women throughout the period of labor. In the first and second stages of labor sporadic, slow fluctuations of the minimal intrauterine pressure were found in the interval between pains, in the form of successive uterine contractions unconnected with changes in the principal amplitude and temporal characteristics of the pains.

To study the principles governing uterine contractions during normal and pathological labor, the method of continuous radiotelemetry of the intrauterine pressure during the three stages of labor has been used in the writer's department since 1966 [2-5, 7]. The "Capsule" and "Complex" systems devised under the direction of E. B. Babskii [1, 6] have been employed.

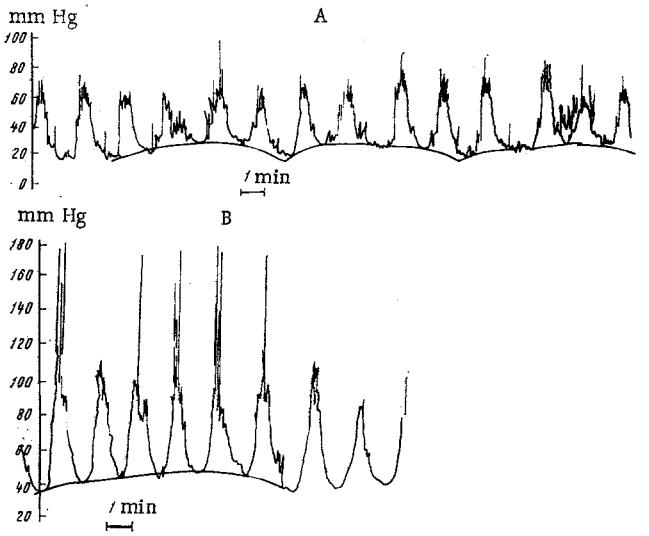

Fig. 1. Waves of minimal intrauterine pressure between pains during the first (A) and second (B) stages of labor.

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EXPERIMENTAL METHOD AND RESULTS

A microminiature radiocapsule sensitive to pressure (measuring 1.4 ×0.8 cm together with the power source) is sterilized in 96% alcohol and introduced into the uterus during normal internal obstetric examination above the region of contact of the presenting part (head or pelvis) with the bony margin of the pelvis inlet. The radiocapsule lies between the fetal membranes and uterine wall if the membranes are intact, or in the amniotic cavity after their rupture. Radio signals are received by an antenna located near the women in labor, connected to a receiver-analyzer with recording system. Fluctuations in intrauterine pressure arising during pains are recorded on squared paper tape of an automatic writer moving at a speed of 2 cm/min. High accuracy of the amplitude measurements is obtained by calibrating the radiocapsule against a mercury manometer over the range from 0 to 200 mm Hg before and after the end of the investigation.

In January, 1969, in the course of an investigation of electrical potentials recorded during contractile activity of the uterus during normal and abnormal labor, slow wave-like fluctuations of intrauterine pressure were obtained in the intervals between pains, in the form of successive uterine contractions. The "waves" usually began with a steady increase in minimal intrauterine pressure up to 5-10 mm Hg over a period of 2-5 min, followed by a similar or even slower fall of pressure to the original level. The fluctuations of pressure during periods of functional rest of the uterus between contractions were not connected with movements of the woman in labor and were not accompanied by increased frequency of the pains, by their discoordination, or by any other changes in the principal amplitude and temporal characteristics of the uterine contractions. Single waves or groups of two or three waves were found inconstantly during the first and second stages of labor (Fig. 1). The phenomenon of fluctuation in intrauterine pressure in intervals between labor pains perhaps reflects changes in slow electrical activity of the smooth-muscle fibers of the uterus and may be associated with the action of regulatory mechanisms influencing both the initial level of contraction of the uterine musculature before the pain, and also the circulation of blood in the uterus.

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