OXYTOCIN AND FOETO-NEONATAL STRESS

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SUMMARY

The advantages of oxytocin infusion in labour are well known and the results are in some way interesting.

Howerer, the limitation and possible disadvantages deriving from its use should not be disregarded.

In a research on foeto-neonatal stress due to various pathological conditions of pregnancy and labour, it was observed that oxytocin infusion often worsens this stress.

Data from a series of hundred cases are rewieved and discussed, pointing out the possible mechanisms of action.

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The systematic use of oxytocin, in an effort to concentrate the largest number of deliveries within regular working hours when the largest number of medical and para-medical personnel is available, has increasingly grown in the past years.

Beyond this reason there is however the habit of making a routine use of oxytocin infusion in the majority of labours.

It has been recently noticed that sometimes foeto-neonatal pathology had become particularly evident in cases of elective induction of labour with oxitocin infusion and amniorexis combined, even though it has'nt been yet possible to determine what part of this negative results is due to one or the other.

In literature we find many observations which testify the absolute safety of oxytocin and an equal number of observations testify its potential danger. If the material and methods used in these studies are systematically analysed, one will observe how very often the discrepancy in the results depends on the fact that cases cannot be compared.

It is of great importance to avoid this sort of confusion because it is a common opinion that those who use such methods do not always take in consideration the dangers, the limits and the controindications to their use.

In regards to oxytocin it must be remembered that the sensitivity of the gravid uterus to this drug cannot be predicted, if for no other reason, because of the complexity of the interaction between endogenous and exogenous oxytocin, between oxytocin and amniotic, decidual and myometrial prostaglandins and between oxytocin and estrogen and progesteron level. It must be also remembered that even at a minimal dosage it can sometimes cause a sustained tetanic contraction; that the effects on the foetus are dose-dependent; that sometimes we tend to underestimate the many controindications to its systematic use, such as high risk pregnancy, placental insufficiency, gestational age under 37 completed weeks,

multiple pregnancy, foeto-pelvic disproportion, presentations other than undeflected cephalic ones, great multiparity and presence of uterine scars.

It must be kept in mind that women subjected to oxytocin infusion feel the pain of contraction much more because the increase of the intensity of the contraction is not progressive, as in normal labour, but reaches rapidly high values.

Naturally the use of infusion-pump should reduce this and other secondary effects, but unfortunately its use isn't as common as we would like it to be. Even in women already prepared to delivery with the R.A.T. method and subsequently subjected to oxytocin infusion during labour we have noted a decreased tolerance of pain and a less controlled behaviour compared with untreated subjects.

On the basis of all these observations our intent of evaluating the real role of oxytocin was increased when during a study on foeto-neonatal stress under various conditions of labour and delivery we had the sensation that infants born of mothers subjected to oxytocin infusion showed a higher degree of stress than those born through deliveries spontaneouslv started and evolved.

We have therefore wanted to control if there was a difference in the values attained by this stress in the two situations.

MATERIAL AND METHODS

Our first problem was to gather an extremely omogenous number of cases so that the only variable would be represented by the oxytocin infusion.

To this effect we controlled 50 primiparous women from the Veneto region; age between 20 and 25; of middle and middle-low socio and cultural status; who delivered between the 38th and 41st week of gestation newborns weighting between 2800 and 3500 grams; after physiological pregnancy and without any problem of placental insufficiency; whose labour started spontaneously, was uncomplicated and lasted between 8 and 10 hours; who underwent, after amniorexis, treatment with oxytocin infusion at the dose of 10-16 mU/min starting at a dilatation of 2-3 cm.

The use of any other drug was avoided. None of the subjects of this group showed abnormal behaviour or loss of self-control during labour. In the case of cord entanglement the subject was excluded from this study.

The control sample consists of 50 primiparous women with characteristics comparable to those of the preceeding group, who also had spontaneous start of labor, who underwent amniorexis at about 3 cm dilatation and differing only in that they were not treated with oxytocin infusion.

The use of the one or the other type of treatment was randomized.

The evaluation of foeto-neonatal stress is based upon the following parameters: 1) Apgar score at the 1st and 5 th min after birth; 2) skin colour and its changes; 3) time of passage of meconium; 4) rectal temperature at 20'-30' after birth; 5) behaviour (beginning and type of sleep, irritability, kind of crying); 6) response to the test of maternal heart-beat (120/min) performed at the 4th hr.

So as to have an omogeneous criterion of evaluation for all concerned the parameters were quantified, each one with a maximum of 5, a minimum of 1.

Consequently the physiological or normal stress falls between 30 and 25, moderate stress between 24 and 20, the severe one between 19 and 15 and the very severe one under 15.

RESULTS

The results obtained are summarized in the following chart:

	Neonatal stress				
	Normal	Moderate	Severe	Very Severe	Total
With oxytocin infusion	5	34	11	0	50
Without oxytocin infusion . . .	35	15	0	0	50

$P < 0{,}001$ (chi square test).

The difference between the two samples is evident and highly significant.

CONCLUSIONS

All this happens under conditions that we may define as ideal: there was no pathology in pregnancy or in labour; elective inductions were excluded, agitated subjects were also excluded because of the possibility of their inducing a metabolic acydosis, but it is still evident however that oxytocin is to a certain degree responsible in increasing the stress of labour.

It can be important to keep in mind these data because with a continuous spread of the systematic use of oxytocin it becomes too easy to forget its secondary effects.

Oxytocin is a useful and powerful drug, which can be of great help in obstetrics but of which, as with all drugs, one must never forget the negative potential, especially at the high dosage, and which therefore must be used with extreme care.

In agreement with many AA. and particularly with Montevideo school we feel we must give some reference points:

— when labour starts and proceeds normally there is no reason to practice an infusion only to speed up artificially its evolution;

— administration of oxytocin is justified only when labour is interrupted or proceeds very slowly because of an insufficient uterine contraction;

— a spontaneous labour is preferable to an induced one, but if it has to be induced by oxytocin, it is better to cause the minimum of uterine activity sufficient to the purpose;

— whenever oxytocin is used, particularly in high risk pregnancies, it is mandatory to monitorize the labour.

Finally we want to point out the following important fact: there have been cases in literature of psychomotor troubles in follow-up controls of children born from oxytocin-infused labours.

It seems to us that these observations may not be free from criticism; however it is possible, if in ideal condition there is an increase of stress, that in pathologic situations and in conditions lacking a monitorized labour, the potential dangerousness of oxytocin could be responsible of permanent cerebral damage.