CLINICAL SIGNIFICANCE OF CEREBRAL OXYTOCIN IN DELIVERY-ASSISTED NURSING

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ABSTRACT

Purpose: *Induction of labor by intravenous infusion of oxytocin is widely used in the primary and secondary hospitals. Statistical comparison is made among pregnant women who are apt for vaginal induction and agree to use oxytocin in the past one year.*

Methods: *Administer intravenous infusion of oxytocin, adjust its speed to synchronize with uterine contraction, and adjust the psychological state of the parturient women to help them to adapt to their new role.*

Results: The assisted delivery has reached a success.

Conclusions: *Intravenous infusion of oxytocin can regulate the frequency and rhythm of uterine contraction, thus shortening the labor process. At the same time, proper health education can reduce the tension, anxiety and fear of parturient woman, thereby increasing the effect of assisted delivery.*

Keywords: *Assisted delivery, Cerebral oxytocin, Nursing.*

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Introduction

Delivery is a major stress event in humans, which stimulates the body to produce a series of behavioral and emotional responses that are directly related to the neuroendocrine system. It has been found that hormones such as oxytocin endorphin, prolactin and epinephrine/norpro-nephrin take part in the regulation of maternal behavior and emotion during delivery, which is beneficial to the progress of labor process and the health of mother and infant[1]. Oxytocin is produced in the limbic system of the human brain (see Figure 1), most of which is released into the blood through the pituitary gland, which plays a peripheral role in regulating uterine contraction and promoting milk secretion. A small amount of oxytocin spreads to the hypothalamus and becomes the cerebral oxytocin, plays a central role as a neurotransmitter, exerting an important influence on maternal behavior and emotions. In the past 10 years, the role of cerebral oxytocin has attracted wide attention of relevant scholars. Studies at home and abroad have found that this hormone is directly related to anti-anxiety and pain relief, which can help to promote maternal behavior and trust relationship[2]. At the same time, non-nociceptive sensory stimulation, such as caressing, hugging, sexual behavior, private environment with a dim light, and other attachment behaviors, such as breast milk sucking, mother-to-child gazing and other, will promote the secretion of oxytocin. Therefore, the correct understanding and application of cerebral oxytocin in normal delivery will be an important issue that needs further exploration and research in the field of assisted delivery.

In recent years, related studies in neurobiology and neuropsychology have shown that cerebral oxytocin can promote maternal behavior, promote mother-infant attachment and individual social interaction, strengthen trust relationships, and enable individuals to be more generous.

Thus, oxytocin is called the hormone of love. At the same time, cerebral oxytocin has anti-anxi-

ety and anti-depression function, can increase pain threshold, lower blood pressure, slow down heart rate, promote gastrointestinal function and individual growth. These functions help women to maintain a calm and open attitude in the process of childbirth, and thus oxytocin is considered to be the only medium for a "quiet and cheerful" response[3]. If the nursing staff can correctly understand the function of cerebral oxytocin, it will be helpful to correctly guide the parturient women to exert the instinct of secretion of oxytocin in normal delivery, complete delivery more naturally, promote the parturient women's consciousness of self-control in delivery, and improve the satisfaction of delivery.

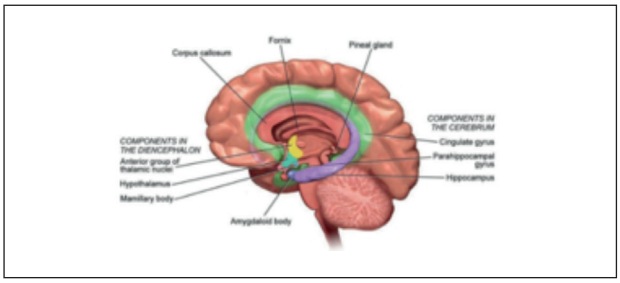

Figure 1: The brain edge system that controls emotions.

Cerebral oxytocin plays an effective anti-stress and anti-anxiety effect in mammals and is considered to be an important biological substance for regulating stress response. At present, many animal experiments have shown that cerebral oxytocin reduces the secretion of adrenocorticotropic hormone and cortisol associated with anxiety by inhibiting the function of the hypothalamus[4], In particular, the decrease in secretion of cortisol in female animals is even greater than that in male animals, suggesting that oxytocin has a more pronounced anti-anxiety effect on females (see Figure 2). Other studies have shown that compared with men and non-pregnant women, the level of cerebral oxytocin in perinatal women is significantly higher, indicating that the anti-anxiety effect of oxytocin on perinatal women is more prominent[5]. Other studies have shown that the dysregulated secretion of oxytocin may be associated with depression, and that the individual's lack of oxytocin or reduced sensitivity to oxytocin may result in depression. At the same time, level of oxytocin in plasma in depressed female individuals is lower than in normal subjects, but oxytocin level in plasma in male subjects is not associated with depression[6]. Thus, the dysregulated secretion of cerebral oxytocin may be a physiological marker of postpartum depression in women, but this conclusion needs further clinical validation.

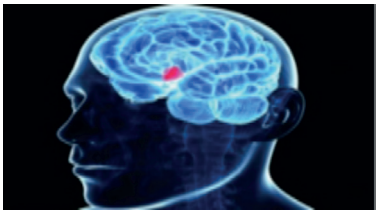

Figure 2: Suppression of the lower brain.

Research Principles and Methods

A total of 237 cases of full-term parturient women who are suitable for vaginal trial delivery and are willing to use oxytocin for delivery with agreement of their family member, are selected as subjects. They are divided into two groups, 138 cases of primipara and 99 cases of multipara. A total of 48 cases give birth 1 to 2 hours after effective contractions, including 41 cases of multipara and 7 cases of primipara. A total of 121 cases give birth 3 to 4 hours after effective contractions, including 73 cases of multipara and 72 cases of primipara. A total of 42 cases give birth 5to6 hours after effective contractions, including 1 case of multipara and 41 cases of primipara. A total of 16 cases give birth 7 to 8 hours after effective contractions, including XX cases of multipara and 7 cases of primipara. Among them, 9 cases fail the induced labor by intravenous infusion of oxytocin, including 2 cases of multipara and 7 cases of primipara. In addition, there are 124 cases that are well-adapted to the new role and highly cooperative in the process of delivery, including 68 cases of multipara and 56 cases of primipara. There are 84 cases that are well-adapted to the new role and properly cooperative in the delivery process under guidance, including 27 cases of multipara and 57 cases of primipara. There are 4 cases of multipara and 16 cases of primipara who are ill-adapted to the new role and basically cooperative in the delivery process through patient guidance.

The dripping rate of intravenous infusion with 2.5to3 units of low dose oxytocin plus 500 mL of 5% glucose shall be determined according to the intensity of uterine contraction, cervical maturity, changes in fetal heart rate and the amniotic fluid property in the course of induction of labor.

Parturient women who have not entered the first stage of labor: The parturient women do not have regular contractions, but only intermittent abdominal pain. Some has the overdue pregnancy,

with vaginal bloody discretion, while others have premature membrane rupture, but the fetal heart is stable, all with amniotic fluid index> 5mL. Vaginal examination results: cervix dilatation of 1 to 3cm, cervical canal length of 0.5 to 1.0cm, thin soft cervix or non- ring cervix of multipara, head position, and normal range of pelvic diameter line (see Figure 3). For the parturient women who and whose families agree to induce labor with oxytocin, the adjusted dripping rate is as follows. Initially, it is 8 to12 drops/minute for primipara, 12 to 18 drops/minute for multipara. Adjustment is made once every 15 to 20 minutes, by 5 to 8 drops/minute for the primipara, and 8 to 12 drops/minute for multipara. After effective contractions (continuation of 30 to 40s and intermittent for 1 to 2 minutes), it is raised once more to maintain effective contractions, increasing by 3 to 5 drops/minute for primipara, and 5 to 8 drops/minute for multipara. The maximum dripping rate shall not exceed 60 drops/minute. If the effective contraction cannot be realized, after the rate is adjusted to 60 drops/min, increase the oxytocin content, usually to 500mL of 5% glucose plus 3 to 5 units of oxytocin, but the dripping rate shall not exceed 40 drops/minute.

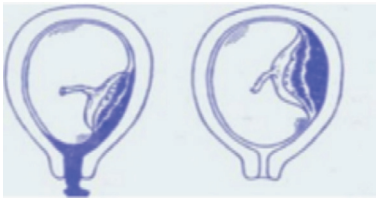

Figure 3: Pregnancy-induced hypertension syndrome.

Parturient women who have entered the second stage of labor: regular uterine contraction, insufficient contraction intensity, the duration of less than 205, an interval exceeding 3 minutes, stable foetal heart, and clear amniotic fluid. Vaginal examination results: cervix dilatation of 2 to 3 cm, cervical canal length of 0.5cm or flattened cervical canal, non-ring cervix or trumpet-shaped cervix of multipara, and head position. The adjusted dripping rate: Initially, it is 12 to 16 drops/minute for primipara, 15 to 21 drops/minute for multipara. Adjustment is made once every 15 to 20 minutes, by 8 to 12 drops/minute for the primipara, and 10 drops/minute for multipara. After effective contraction, when the duration is 40-505 and the interval time is 1-Zmin, adjust the dripping rate, increasing by 5 to 6 drops / minute for primipara, and 8 to10 drops / minute for multipara. The maximum dripping rate shall not exceed 60 drops/minute. If the effective contraction cannot be realized, increase the oxytocin content, usually to 500mL of 5% glucose plus 3 to 5 units of oxytocin, but the dripping rate shall not exceed 40 drops/minute.

The observation and analysis of abdominal shape is particularly important after the parturient women have effective contractions, especially when the contractions are strong. The normal abdominal shape with contractions is as follows. The womb base is circular, the middle part is swollen, and the lower part is slightly flat and narrow, with consistently rhythmic, symmetric and grading contractions. If the rhythm and symmetry is not consistent, it is necessary to immediately deal with symptomatic treatment, such as sound lJ uterine surgery preparation after inhibition of contractions (see Figure 4).

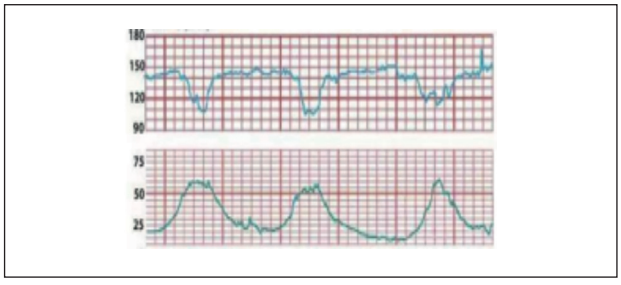

Figure 4: Chart of fetal electronic monitoring.

After intravenous infusion of oxytocin for 30mintolhour, the intensity of oxytocin is sustained at 30to40s, intermittent at 1 to 2minutes, and the cervix is dilated 2 to 4cm on the original basis. Primipara can give birth in 2 to 3 hours or so, and multipara can give birth in 0. 5 to 1 hour or so. If after the effective contraction lasts for 2 to 3 hours, the cervix is not ideally dilated, only 1 to 1.5 cm for the primipara, and 1 to 2 cm for the multipara, there may appear inner pelvis stenosis or the blocking of head raising or lowering, other methods shall be taken to terminate the delivery.

Results and Analysis

The comparison of delivery time and role adaptation after effective uterine contraction is shown in Tables 1 and 2. As shown in Table 1, how to adjust oxytocin for effective contraction in delivery process and how to adapt the role of parturient woman to the best state after effective contraction are the core issues for the success in labor.

	1-2h	3-4h	5-6h	7-8h
Secondary childbirth	39	71	0	0
Maternity	7	72	41	7

Table. 1: Comparison of the time between points.

	Good	Better	Bad
Secondary childbirth	68	27	4
Maternity	56	57	16

Table. 1: Comparison of Role Adaptation.

Discussions

In recent years, while scholars at home and abroad have paid attention to the role of cerebral oxytocin, measures to promote maternal oxytocin secretion during childbirth have also received increasing attention. Studies have shown that a warm birthing environment, caressing and hugging and other sexual behaviors as well as early breast-feeding, early exposure, and eating can all contribute to the release of oxytocin and increase blood and cerebral oxytocin levels, so that individuals can develop "oxytocin-like" responses[7]. The midwife's correct understanding and adoption of relevant measures to promote the secretion of cerebral oxytocin will promote the progress and normal delivery of labor and reduce the medical intervention in normal delivery.

Relevant studies have shown that human delivery has common features with the delivery of other mammals, for example quiet, private, and dimly lit environments are preferred during childbirth. The reason is that the secretion of cerebral oxytocin shows a significant change which is high in night time low in daytime, which may be related to the synergistic secretion of melatonin and oxytocin secreted by the human body during night time sleep[8]. The report shows that the amount of oxytocin in the human retina increases in dark light while decreases in bright light. Therefore, oxytocin is also called shy hormone, which provides theoretical basis for providing private, quiet and dim delivery environment for the parturient in assisted-delivery nursing, and also indicates the importance of environmental support during delivery. From this, it can be further inferred that the physiological necessity of closing eyes of the parturient woman during the delivery process may be one of the ways to promote the secretion of oxytocin. At the same time, there are studies show that due to the increased oxytocin secretion at night, most parturient women's delivery time is between 0-5 o'clock. After that, a private, dimly lit "night-like" delivery environment is continuously provided for the parturient woman so as to facilitate their sleep, thus to speed up the delivery process and alleviate the pain of parturient woman[9]. Therefore, to explore the effects of different delivery environments on maternal oxytocin secretion and to promote maternal satisfaction with the delivery environment will become a new area for further research on delivery-assisted nursing. In recent years, some scholars have compared the parturient woman with caesarean section and those with natural delivery and have found that the breast-feeding time for women after caesarean section is 2 to 3 days later than that of the woman after natural delivery due to lack of early skin contact. As a result, there is a relative reduction in the secretion of cerebral oxytocin, leading to certain differences between women with caesarean section and those with natural delivery in maintaining calmness and social interaction[10]. It fully demonstrates that the medical intervention of caesarean section violates the natural law and instinct of establishing tie and attachment relationship between mother and infant in normal delivery, which affects the health of mother and infant to a certain extent[11]. Therefore, the reduction of the non-indicative caesarean section rate is still a problem that relevant scholars need to further explore[12].

Cerebral oxytocin plays a key role in the regulation of endocrinology during normal delivery, and it has a regulating mechanism for instinctive behaviours, such as resisting anxiety, relieving pain, promoting maternal behaviour and establishing trust relationship[13-14]. At the same time, a large number of studies have shown that non-nociceptive sensory stimulation nursing during delivery can induce the secretion of cerebral oxytocin, such as setting up suitable delivery environment, guiding sexual behaviour, promoting early contact between mother and infant, early sucking and accompanied delivery and delivery nursing, etc. Correct implementation of these physical instinctive behaviours and sensory stimulation methods will be conducive to the success of normal delivery and beneficial for maternal and infant health[15].

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