

The Birth Trauma: An Opportunity or Inevitability?

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Abstract: Many decades the phenomenon of the birth trauma is discussed. Many experts consider that it is **inevitable**, and each man is a carrier of such trauma. Author of the article describes the scientific and clinical data, which could be considered as “a natural anti-stressful (painkiller) system of protection of the mother and her child in labor (NSPL)”.

Unfortunately, the real life in a civilized society creates serious social, psychological and biological handicaps to functioning of this system. That is why birth trauma is **possible** and meets with high frequency. The knowledge NSPL could promote the formation of public opinion about birth as a natural process, and could liberate a part of society from fear of pain during the labor. It is a serious substantiation for modern technologies of preparation of the pregnant women to the delivery. All these could decrease the frequency of a birth trauma.

Key words: *birth trauma; birth stress; pain, hypoxia, and fear in labor; natural anti-stress system in labor; painkiller system.*

Introduction. Since Otto Rank, the psychoanalysts began to discuss a phenomenon of birth trauma(47). Psychotherapist S. Grof supported this idea but he considered the birth trauma with absolutely other position. According to the Grof's theory of Basic Perinatal Matrices (BPM) the child receives a trauma, when he passes through the birth channel. The injuring factors after the beginning of labor (BPM-II) are: 1) contractions of the uterine muscles, which periodically compress a fetus, causing sensations of pain; 2) hypoxia, connected with the complicated delivery of oxygen to a fetus because the vessels are compressed; 3) fear, connected with the intensification of uterine contractions, and the cervix is closed and exit is still no. The adult experiences these prenatal's feelings during the reactivation as insuperable sensations of a growing alarm and realizing of approaching of fatal danger (25,26). Describing this situation, Seelig (59) wrote: "The walls of the uterus is contract, subjecting the fetus to enormous physical pressures which if measured and exerted upon the skull or body of a grown person who's skull-structure is considerably harder than the fetus' cranium, would still be sufficient to arouse severe anxiety."(p.333). Author summarized: "...there is hardly anybody who has reported the second matrix to be positive in any way."(p.333). In opposition to this J.Turner& T.Turner-Groofs' (68) have stated opinion that "...unless there is a medical crisis the birth itself is not so traumatic"(p.30). L.Janus (27) also considers: "In good circumstances the birth can be something like an ecstatic adventure and peak experience"(p.47).

Some questions always come to the fore: Why does the natural process of reproduction prior to conception begins with pleasant emotions? Why there is no pain during a normal pregnancy when both mother and child are constantly transformed, including the stretching of the uterus with a fetus that continues to grow? So why is the process of birth of the new being accompanied by a trauma? More over, the birth trauma can be so intense that it leads to neurotic disorders. According to the opinions of some experts, all people to a greater or lesser degree are traumatized by their birth. But what is the logic of birth of “the injuring people”? Really, why is the Nature so imperfect or made a mistake and does not take care of protecting the child against trauma? Are there natural mechanisms that protection against birthing trauma, about which we don't know anything? Maybe first we must consider the facts, which we good know, and maybe we need to change our point of view on them?

The purpose of this work is: to analyze the known scientific facts and clinical data from a position of their possible participation in the protection of the mother and prenatally against the birth trauma.

Materials. A lot of data I took from a Manual on Williams Obstetrics¹ [70], which is the basic Textbook for the obstetricians of the USA, Israel, and other countries. Also other scientific data published in English and Russian books and journals are analyzed.

Results.

1. Uterus: physiological denervation. It is known, that a single organ - uterus consists of two parts: body and cervix, which during pregnancy and labor function differently. During the pregnancy the increasing of muscular cells of myometrium is accompanied by the increasing of the nervous elements, the numerous nervous fibres, the hypertrophy of neuroplasm, the increase of number nervous fascicles, and zones of receptors. At the end of pregnancy the quantity of sympathetic nervous fibres in myometrium considerably decrease, and at the laboring women the sympathetic nervous fibres around of vessels and in myometrium couldn't be found. Simultaneously the content of noradrenalin (the basic uterine catecholamine) to the beginning of labor is sharply reduced (5, 51). The authors consider it as "a physiological denervation (desympathization) of uterus". The experimental researches confirm this data: the sharp fall of noradrenalin in uterus and in uterine sympathetic neurons to the moment of labor occurs (66, 74). The degeneration of neurons are accompanied by their ability less to absorb tagged noradrenalin (on 60%), and the activity of tyrosine hydroxylase² falls (on 90%) (3, 51). We can suppose that denervation of uterus protects the automatism of myometrium and the woman against the flow of pain impulses.

2. Cervix: ripening and dilation. Two basic structural components of cervix there are: smooth muscular cells (SMC) and extracellular matrix (ECM). Cervix comprises only 10-15% of the SMC. Others basic structural components of cervix (the ECM) are a connective tissue, which include glycosaminoglycans³ (GAGs), proteoglycans, elastin, and type I, III, and IV collagen [p.140]. As a labor approached the uterine body loses the extensibility and unresponsiveness, and the cervix, in contrast, softens, relaxes, shortens and prepares for dilation [p.136].

It occurs because: the cervical modifications involve changes in the connective tissue: the breakdown of collagen, increasing of collagen solubility, rearrangement of the collagen fiber bundles - their number and sizes are decreased [138],(48). The content of dermatan sulfate, which is in need of cross-linking collagen fiber, decreases too. Cabrol and co-authors (9) have marked with surprise the striking increase in the amount of hyaluronic acid in the cervix, with a concomitant increase in water. Leukocytes, infiltrating of cervix, promote the degradation of collagen too[141]. Prostaglandins change the concentration of the GAGs and cause transformation of collagen [p. 153]. In addition, the blood in vascular lacunas of cervix is accumulating because the arterial inflow increases during contraction (28,53,56). The molecular processes of ripening are regulated by genes (48, 67). These changes in cervix provide a sufficient extensibility of its tissues, which is completely painless, and they create the conditions for unimpeded pass of the fetus.

3. The lower uterine segment (LUS) at the beginning of labor is gradually formed. Before the onset of labor the fetal head often descends there or even through the pelvic inlet. During labor the rather passive LUS is thinned appreciable, turning into a thin wall of the

¹ Here and following I give data from Williams Obstetrics. 2010. 23rd Edition. NJ, Toronto. McGRAW-Hill, Medical Publishing Division. Eds *Cunningham FG. e.a.* and in text I will be suggest the numbers of pages only in square brackets.

² Tyrosine hydroxylase is the enzyme responsible for catalyzing the conversion of the amino acid L-tyrosine to dihydroxyphenylalanine (DOPA). DOPA is a precursor for dopamine which in turn is a precursor for noradrenaline and adrenaline (38)

³ Glycosaminoglycans (GAGs) are long unbranched polysaccharides consisting of a repeating disaccharide unit. Distinguish 7 groups of GAGs: hyaluronic acid, dermatan sulfate, chondroitin-4-sulfate, chondroitin-6-sulfate, heparin sulfate, heparin, and keratin sulfate. Hyaluronic acid is uniquely synthesized without a protein core and is "spun out" by enzymes at cell surfaces directly into the extracellular space (2).

parturition channel for passage of a fetus [p.142]. Thus, the LUS creates conditions for protection of fetal head against the strong contractions and it unobstructed passage through the birth canal.

4. Sizes of the child and basin of the woman are in accordance.

5. The normal fetal lie, presentation, attitude, and position. A longitudinal lie is present a greater than 99% of labors at term. The term fetus usually present with the vertex of occipital presentation (in 96,8% the head is sharply flexed), and the left occipito-anterior position (approximately in 70% of labors). [pp. 374-376].

6. The mobility of prelate during labor is necessary and contributes to his protective reactions. It includes the moving, and rotation [pp. 380-384]. It seems that the child intuitively finds the most expedient way of passage through the pelvis with his great sizes through great sizes of maternal basin. It is known that only human fetus rotate during his delivery.

7. Dividing of amniotic fluid protects fetal head (forebag), saves the back fluids (back bag), and this protects fetus' body against pain during contraction.

8. The contractile-inhibitor system. It is known that labor is connected with contractile activity of the myometrium, which is initiated and controlled by uterotonic biologically active substances (BAS). The mechanisms of contraction and the relaxation of SMC myometrium are described in detail in Williams Obstetrics [Pp. 148-154]. The activity of this system includes the **phenomenon of the accelerated uterotonic degradation** of contractile substances by specific enzymes [pp.153-154]: oxytocin - oxytocinase, prostaglandins (PG) – 15-hydroxyprostaglandin dehydrogenase, endothelins - enkephalinase, histamine - diamine oxidase, catecholamines - catechol-O-methyltransferase, angiotensin-II – angiotensinases, platelet-activating factor (PAF) – PAF-acetyl hydrolase (6,10,20,73,13). The contractile-inhibitor system provides the rhythm of contractions, the soft regulation of uterine condition during the labor, and protects of the mother and prelate against the excessive and painful uterine contractions.

9. The limited duration of contractions. One detail is curious, the duration of uterine contractions - 60 to 80 seconds - does not increase appreciably from early active labor extending through the second stage (46). The constancy of duration of uterine contractions protect respiratory gas-exchange function of a fetus, because respiratory gas exchange in the intervillous space has a 60-80 sec limit that remains relatively constant [p.438]. From here, it is difficult to agree with statement, that "normal labor is a process of repeated fetal hypoxic events resulting inevitably in acidemia", or "...normal parturition is an asphyxiating event for the fetus"[p.430]. On the contrary, as the submitting data show during normal labor there are natural physiological mechanisms protecting a fetus against hypoxia, including their own relative stability to temporary reduction of oxygen blood saturation.

10. The blood circulation during the contractions of uterus. The idea that **hypoxia** can injures the fetus during labor probably has appeared from the conception, that simultaneously with contractions of myometrium the vessels are compressed and the blood circulation in the placental pool is stopped. However during the contractions the blood flow in vessels of myometrium remains stable or even a little increases (24, 30,55). Savitsky (56) especially marks that "the drainage of intervillous space is continued even after the stopping an outside drainage uterus"(p.76). These data received by a direct measurement of volume of blood in placental pool have confirmed the results of computer mathematical modeling of these processes which were done early (60). The preservation of the blood flow in uterine-placental pool during contraction we can consider as the natural mechanism protecting fetus **against hypoxia**.

11. Humoral mechanisms of protection of the blood flow circulating in uterus during contractions. The parathyroid hormone-related protein (PTH-rP) not only decreases reactivity of SMC, but it may serve to maximize uterine blood flow during myometrial contractions by its vasorelaxant action (64,35).

Prostaglandins most commonly have been considered as uterotonins, but PGE₂, PGD₂, and PGI₂ have been shown to cause vascular smooth muscle relaxation and vasodilatation in

many circumstances [p.153-154]. That is, the physiological mechanisms can save the flow of blood in the uterus during contractions.

12. The fetal oxygen saturation. As it is known, normal labor is accompanied by an increasing of acidemia (49), which is one of indirect parameters of hypoxia [p.430]. But acidosis, which arises during labor, is a necessary element for activation of all elements which are carrying out the delivery, and don't grow out in any way by the serious, menacing hypoxia of the fetus. This idea proves to be true by the use of pulse oximetry of the fetus. Such statement seems competent, as the researchers to have reliably registered fetal oxygen saturation in 70-95% of women during 50-88% of their labors by using the unique pad-like sensor for pulse oximetry (72),[p.427]. However..."fetal oxygen saturation normally varies greatly when measured in umbilical artery blood" (4). The low limit of normal saturation by oxygen of fetus' blood is considered 30% (23, 63). The brief, transient fetal oxygen saturations below 30% were common during labor because such values were observed in 53% of fetuses with normal outcomes [p.427]. Saturation values below 30%, however, when persistent for 2 minutes or longer, were associated with an increased risk of potential fetal compromise (8). The submitted data show the fetus has the relative stability to low oxygen saturations, which arises during physiological contractions with their limits 60-80 sec.

13. The vascular pool of uterus: the phenomenon of "cavernous body". The uterine wall includes three layers: inner - endometrium; muscle - myometrium; outer - perimetrium. Myometrium also consists of three layers: internal - submucosal, average - vascular and outside - overvascular. The vascular layer is most advanced. It contains plenty of vessels, mainly venous.

It is known that during pregnancy, the uterus retains a constant and optimum quantity of blood circulating, not participating in moving the blood from one system to another, like the circulation of heart and brain. Optimum quantity of blood in the uterus is preserved during labor. Such type of circulation in uterus is ensured by humoral chemicals such as by acetylcholine (Salganick 1946; Petchenko 1963).

According to the concept of Prof. G. Savitsky (54) the blood flowing through the arteries continues to enter the uterus during the contractions, whereas the venous outflow is complicated because the veins are compressed. At the rise of a contraction, the blood circulation in the myometrium stops for a short time. At this moment, the uterus can be increased a little in volume. It reminds us of the phenomenon of "cavernous body". This phenomenon is like the erection of the penis, where there is "...an dilation of the arterioles and arteries by increased blood flow, trapping of the blood by the expanding sinusoids; compression of the subtunical venular plexuses, reducing and even decreasing the venous outflow to a minimum" (16, 33). Authors suggest that the intra-cavernous pressure is increased up to 100 mm Hg, and further pressure increase to several hundred mm Hg (rigid erection phase). (El-Sakka, Lue 2004) I would like to note that this pressure is not accompanied by pain sensations. In Williams Obstetrics it is specified: "When the uterus is in a contracted state its numerous venous lumens are collapsed. But in injected specimens the greater part of the uterine wall appears to be occupied by dilated venous sinuses" [p.26]. If the Savitsky's concept is correct, the participation of a vessel layer myometrium in the mechanism of contraction protects a mother against pain in contractions, and a fetus' body from being injured by the compression of contractile muscles.

14. The intra-amnion pressure. Quantity of intra-amnion pressure during contraction was measured by the special device and equally, on average, 40 mm Hg, with limits of fluctuations from 20 up to 60 mm Hg (58), [p.142, 437]. In addition to atmospheric pressure it corresponds approximately to pressure in 50gr/cm². Accounts made at our request by the engineer of G. Ronin have shown, that at the rise of contraction the fetus can feel the maximal pressure equal 185,5 kg across the surface of its entire body⁴. We believe that the major factor allowing living organisms to transfer significant loadings is due to the opportunity and ability to compensate because of the alignment of internal and external pressure. The pre-nate in an amnion

⁴ We conditionally accept that the term child has grown to 50 cm and weighs 3000.0,. The surface of its body is equal approximately to 2273 cm². At recalculation of 60 mm Hg is equal 81,6 g/cm². From here, 81,6 g/cm² X 2273 cm² = 185 477g or 185,5 kg.

bag, due to permeability of his cellular membranes and tissues, is in the dynamic balance with an amnion liquid and also with mother's circulation system. From this, it is necessary to conclude that the increase of pressure during the contractions of the uterus does not cause harm to the prenaté, as he is in a balanced condition. He quietly can sustain the contractions allocated at regular intervals and with the specified maximal loading (50). Of course, if other situations take place, such as: the preterm rupture of the membranes (spontaneous or artificial) and the amnion waters are streamed out or if the prenaté is in a breech presentation the prenaté's body and head can be exposed to significant compression. But during normal labor the intra-amnion pressure, even at the peak of contraction is natural and not dangerous to a prenaté, provided amnion waters are preserved.

15. The specific endogenic painkiller system functions in the organisms of mother and prenaté. It is assisted by like-morphine opioids (beta-endorphins and others). Their secretion is increased during labor with a peak at the moment of passage by the prenaté of the vulvar ring (1, 14, 19, 32, 65). It is suggested that this painkiller system plays a significant role in the protection of the mother and prenaté against painful contractions.

16. Psycho-emotional protection of the woman against stress during labor. The third factor which can injure of a fetus is a fear (26). According to modern paradigm, the unborn child has emotional perception and actively functioning memory. From here, the fear of prenaté can be: a) his mother's feelings of fear perceived him before and during birth, b) his own perception of the factors influencing to him, c) or his own stress-reaction to that and another simultaneously. It is necessary to have in mind that besides the fear the conditions of stress both the mother and the child can arise under influence others by the contents of psycho-traumatic circumstances. In the beginning I will try to consider the problem: whether there are for the woman protective mechanisms against fear, against stress before and during labor?

a) Physiological processes in the central nervous system(CNS). The activity of a cerebral cortex is quickly reduced to the beginning of labor; simultaneously the excitability of the brainstem's centers grows (29, 39). The change of excitability of cortex "promotes the thin regulation of parturition and protects both the woman and child against pain and stress during labor" (45, p.370).

b) Psychological changing during labor. It is known, that during labor the women can fall into a trance condition, which decreases a level of emotional stress and their reaction ("she departs to other planet") (41). Research of the psychiatrists (61, 62) showed that 78% of women during labor and the early postpartum period suddenly had a phenomenon of an unusual condition of consciousness: a) the subjective feelings of deep "pleasure-happiness", b) mental contact with the child, c) the experiences of lived life pass in front of their mind's eye, d) mental contact with relatives less often was registered. About 8% of women had the phenomenon "out-of-body experience" (OBE) during their labor: the women observed themselves, and events from a distance during some time. The women, who has gone through these conditions unanimously asserted that it is characterized not only feelings OBE but also complete disappearance of a pain for the period that OBE occurs (61).The authors believe that the altered states of consciousness are a) a protection of the brain, b) a method of activation of protective physiological mechanisms of health. It is also a psychological defense mechanism.

c) Biochemical factors. Before and during labor the women have changes of physiological processes in CNS, activation of endocrine system and endocrine function of neurons, which create a neurotransmitter-hormonal cocktail including endorphins, oxytocin, prolactin, serotonin, corticosteroids, dopamine, noradrenalin, and others. Such neuro-endocrine background promotes the development of the changed condition of consciousness, which protects the woman (so also of child) against laboring stress, against perception of possible pain sensations. Of course, the part of women are available that retain complete conscious control of the situation. They understand and perceive the parturition, and they construct their own psychological protection.

17. The gradual beginning of labor. Parturition never begins suddenly with strong contractions. During the phase of preparation for labor [p.141] women usually feel the lowering of a stomach, the more frequent urination, the secretion of mucous, the feeling of a pressure below the stomach. It is possible to consider these as preventive maintenance. The sudden onset of labor can be frightening to woman, and these symptoms cause her to mobilize her forces. The message is clear: the joyful event, the long-awaited meeting with her child is near!

Uterine contractions are involuntary and for the most part independent of extrauterine control [p.141]. According to Caldeyro-Barcia and Poseiro there is no clear-cut division between prelabor and labor, but rather a gradual and progressive transition (11). Before the beginning of labor the woman experiences a tension in a stomach, which begins to repeat in 15-20 minutes, with the duration of 30-40 seconds. Gradually the intervals between contractions are shorter while the contractions gain in length and strength. At the onset of the first stage of labor the intervals between contractions are diminished gradually from about 10 minutes to as little as 1 minute or less in the second stage. [p. 141-142]. We can assume, that the Nature has created conditions in order the mother and fetus become gradually accustomed to the unusual sensations and that are prevent their fright.

18. The steroid self-anesthesia of prelate. The prelate also actively contributes to the protection against stress itself and its mother. This contribution includes first of all the endocrine cascade. Amazingly, but three weeks prior to term labor the fetal adrenal glands begin increase sharply their size and at the moment of labor they weigh as much as in the adult man(!). During the last few weeks of pregnancy the secretion of steroid hormones by adrenal glands of a full-term fetus corresponds 100-200 mg/ day, which is a higher, than the level of secretion in adults at rest - (30-40 mg/ day) (36),[p.138].

The levels of corticotropin-related protein (CT-rP) in the amnionic fluid and in the mother's blood plasma at the end of pregnancy *amazingly sharply* increase, causing an appreciable increase of the biologically important CT-RH levels (43,44). In pregnancies where the fetus is considered to be stressed as a result of various complications, the concentration of CT-RH in fetal plasma, amnionic fluid, and maternal plasma are increased compared to normal gestation (7, 21,22,34), [p.157]. In placentas from the women with preeclampsia the content of CT-RH is fourfold higher than in those with normal pregnancies (22, 43). Soon after birth the sizes of the newborn's adrenal glands and the levels of corticoids hormones decreases quickly. It is supposed that the hypertrophy of fetal adrenal glands and their hyperfunction occur under the influence placental corticotropin [p. 157]. The significant development of adrenal glands and high level of corticosteroid hormones probably reflect the preparation of protective mechanisms safeguarding the prelate against stressful situations, which can accompany birth.

19. An altered state of consciousness of prelate. The prelate probably also goes into an altered state of consciousness under the influence of his own neurotransmitter-hormonal cocktail which includes endogenous morphine (endorphin), corticosteroids, noradrenalin, oth. They protect of the prelate against labor stress (19, 32). We can assume that this cocktail protects also newborn baby against a very strong stress of the first hour after birth. The altered state of consciousness helps the newborn baby at acute adaptation at this time. The phenomenon of prelate's "out-of-body experience" during the delivery has been described as well by Chamberlain (12, p185-187).

20. The maternal love for her unborn child. Most powerful, protective anti-stress and anti-pain mechanism is the mother's love for her unborn child. It is possible, if the mother has ability to love (42), feels silent happiness from comprehension of life, developing in her, when she lives in a prevision of joyful meeting with the child, when she is ready on any experiences for his sake, and she suppresses any her fears. Such psychological condition of the pregnant woman, probably, can raise her threshold of pain sensitivity. It can be ensured by the genetic factors, by the perinatal memory of own birth, by the social and neurobiological factors. As Esch and Stefano (17) suggest love also is "a complex neurobiological phenomenon... which critically involve oxytocin, vasopressin, dopamine, serotonergic signaling... endorphin and endogenous

morphinergic opioids”(p.226). The high levels oxytocin - also called the “love hormone” - by the direct influence on a brain, shape parental behaviour (42, 69). This effect of oxytocin amplifies in a combination with prolactin and endorphins (40). In a discussing context it is necessary to agree with P. Fedor-Freybergh (18) that "Love, pleasure and lust a stress-reducing and health-promoting potential, since they carry the ability to heal or facilitate beneficial motivation and behaviour"(p. 189). It has the direct relation to the laboring woman: the clinical observations showed - if mother loves and wants the child her behaviour during labor is constructive and the contractions painless or not so painful. In opposite this - if the prenat is unwanted child the labor is very often complicated and painful. As the similar hormonal cocktail is developed and at a prenat, all these neurobiological factors promote the formation of attractive love interrelation between the child and mother, reduce fear and pain during labor, and therefore, protect both from a birth trauma.

Discussion. At the 20th century the psychoanalysts and psychotherapists have put forward the intriguing idea: according to it practically all people during the birth receive a trauma, which in the subsequent life determine their thinking and behaviour. According to O. Rank (47) the basic injuring aspects of birth for the child are a loss of uterus and the parting with mother. In subsequent S. Grof (25,26) on the basis of huge actual material has come to the conclusion, that the birth trauma is a result of influence of parturition: the fetus experiences the sensation of pain during the contractions of uterus, hypoxia, and anxiety when the contractions grow but the conditions for the passing through the birth canal are absent.

The development of perinatal psychology has brought one more idea: prenat has emotional perception and actively functioning memory. During pregnancy and labor the mother and prenat are in close emotional interaction. The consciousness of the mother, and is possible her unconsciousness, includes her mutual relation with a social and ecological environment, and also all that relates to delivery. Woman perceives, estimates, and reacts to the received information according to her psychological features, social status, and her unique views on life. She can feel fear, loneliness, tension, pain, and even panic with approaching of parturition and during labor. These information and / or the provoked feelings of mother can be perceived by prenat, and they can be saved in his memory as his own. That is, the concept of a birth trauma necessary would be considered from the position of role of the mother, her emotions, thinking, and behaviour as well.

One more aspect. The condition of stress of the mother can break the normal parturition and transform physiological labor in pathological labor. Their clinical displays are well known: a delay of disclosing cervix, preterm ruptured membranes, disorders of a rhythm and character of contractions, wrong presentation of a fetus and many other things. Some complications make necessary the medicinal and / or surgical interventions. The last also can cause the serious injuring factors, as well as the formal psychological atmosphere in the maternity department of hospital. It is necessary to add to this, that the system the mother- prenat usually is in a social and ecological environment, which not always is friendly and sympathizing to them.

Thus, **the birth trauma is a multifactor phenomenon**: it is a result of the influence of ecological environment, social surrounding, stress of the mother, the complicated labor, qualification of the personnel, and also the ability of prenat to emotional perception of these influencing factors.

But the birth is an ordinary event from a position of the Nature. It concerns to the birth of the man as well. Nature is ensuring the process of birth and probably the elements of it and their sequence are contained in genes. The normal labor is begin spontaneously, it is supported by automatism of uterus and the numerous regulating systems, and the woman can give birth of the child without any assistance and without a pain (15).

But if labor is a natural process, why it is such traumatic for the mother and the child? Really the Nature has not created system of their protection? These questions were the incentive motive for realization of the given research.

Investigations, submitted above, showed that at the mother and her child before and during the labor the numerous protection mechanisms are included. The woman has: an altered state of consciousness, changing of processes of excitation and inhibition in the cortex and brainstem, high production of neurotransmitters (endorphin, other), activation of neuro-endocrine system (for example, the system hypothalamus - hypophysis - adrenal with superfluous secretion of corticosteroids), physiological denervation of uterus, gradual beginning of labor, other. The clinical observations give us the opportunity to add: maturity of woman as a mother, her love to the wanted unborn child, impatient expectation of meeting with him, stability of emotional condition of a woman.

It is possible to consider as the protective mechanisms of prenat - his position in uterus, the flexibility, and his passing by greatest sizes of the head through the greatest sizes of a mother's basin, relative stability to short-term oxygen insufficiency, other.

One of the protective factors provokes the special surprise: the sharp increase in size of the adrenal glands with superfluous production of corticosteroids. It is known that corticosteroids in plenty protect cells of a brain and other organs against destructive influences of distress, manifesting thus narcotic effect. These property corticosteroids were used for the development of "steroid anesthesia"(57,37,31). Such development of adrenal glands and high level of corticosteroids, probably, is connected with the preparation of protective mechanisms of a prenat for a stressful situation, which accompanies the birth.

One more. The hypertrophy of adrenal glands and their hyperfunction develops at a time when the fetal plasma ACTG levels appear to decline (71). Many investigators believe that corticotropin-releasing hormone (CRH) of placental origin is one of the critical components that facilitates fetal adrenal hypertrophy and increased steroidogenesis late in gestation [p.157]. It also leads to an idea, that the fetal egg (the embryo-fetus, placenta, others elements) has genetically caused, own structural-temporary program of maturing.

This program simultaneously includes a system of anti-stressful protection and initiation of parturition. In my opinion, the temporary hypercorticoidism ensures besides protection of the prenat in labor, also the fast adaptation at the first hours after his birth, protects him against stress of internal reorganization occurring in his organism (inclusion of a pulmonary circulation, beginning of air breath, others) and against stress of external influence (light, noise, open space, difference of temperatures, smells, tactile sensations, others). It is possible to believe, that children born prematurely, have not natural steroid protection, and in a case of placental insufficiency - the protection can be insufficient even at the term labor.

Except for that was mentioned before, adrenal together with others endocrine glands form a protective hormonal cocktail. It is possible to assume, that this cocktail changes emotional perception of prenat the labor, reduces his sensitivity to a pain, protects cells of nervous system and organism against birth stress.

Comparing the protective factors of the mother and child, we have paid attention that many mechanisms and reactions are surprisingly interdependent and expedient. So, sizes of prenat and the sizes of a mother's basin in usual conditions provide unobstructed passage of the child.

The formation of the lower uterine segment assumes both longitudinal position and head presentation of a fetus, which allows protecting his head from the possible strong contractions of myometrium. The division of amniotic fluid also promotes this: forebag protects the head, the fixing of the head prevents the amniorrhea of back fluid necessary for protection of a child's body during contractions.

The processes occurring on molecular, cellular, and tissue level in cervix, ensuring its softening, ripening, smoothing, effacement, dilatation, and full disclosing are surprising. In our opinion, the same processes can underlie a well known phenomenon of **a high extensibility of tissue** of vagina and perineum - a unique condition observed at the women only during labor. This phenomenon provides passableness of a prenat through the birth channel, and protects the woman against traumas of the birth ways.

The contractile-inhibitor system softens the sensations from contractions of myometrium, and the limited duration of contractions corresponds to a temporary interval of respiratory gas exchange in intervillous space for providing of the child by oxygen. The preservation of blood circulation in myometrium during contractions also protects prenatate against hypoxia.

On the eve of labor at absence of handicaps - external and internal (fear, anxiety of woman) - both the mother and maybe prenatate gradually pass in a condition of altered state of consciousness. At the woman it coincides with the inhibition of cortex and excitation of brainstem. Such parity seems expedient, because promotes the transition of functional systems her organism on a mode of self-regulation, promotes the automatism of myometrium: "...uterine contractions are involuntary and for the most part, independent of extrauterine control" [p.141].

It, in its turn, creates conditions for spontaneous processes of disclosing of birth ways, for realization of myometrial automatism, for removal of a mother's tension, imposed by consciousness, and it creates the preconditions for realization of complex and expedient movements of prenatate at passage of the birth channel.

The activation of brainstem provides the conditions for automatic inclusion of neuro-endocrine system and flood of organism by neurotransmitters, and hormones, which protect both the mother and child against the birth stress.

Thus, the analysis of results of scientific research and clinical data testifies that before and during labor at the woman and her child the protective mechanisms on the personal, systemic, organ, tissue, cellular, and molecular levels are formed. The mother and her prenatate before and during labor constitute harmonious unity and together create the conditions for disclosing birth ways and passing of the prenatate for the birth without trauma. The inclusion of protective mechanisms occurs beforehand and synchronously, and the level of their functioning grows in process of development of parturition.

The submitted data allows us to state the assumption that at physiological labor is formed and functions a **natural anti-stressful (painless) system of protection of the mother and child in labor**. It is possible to assume, that this system of protection is evolution caused, genetically determined and is formed long before labor. At presence of such functioning system the birth trauma is **not inevitable**.

Unfortunately, the real life in a civilized society creates serious social, psychological and biological handicaps to functioning of this system. In modern societies the frequency of normal labor sharply has decreased⁵. It allows us to agree with psychotherapists (Grof, Seelig, oth.) who indicate on significant number of the people with a birth trauma.

The knowledge of existence submitted above a natural anti-stressful (painkiller) system of protection of the mother and her unborn child in labor is serious argument against idea about inevitability of pain and the torments in labor. This knowledge is necessary for formation of public opinion about an opportunity painless birth. It can be used at the psychological preparation of the women for labor with the purpose of prophylaxis of birth trauma. I would like to express reliance, that the future study of system of protection other elements (today unknown) will be revealed. These discoveries will pave the way to amplification of anti-stressful protection and decreasing of frequency of birth traumas.

Summary. Nature has created the mutual system of protection of both mother and child in parturition against pain, hypoxia, and fear, which actively functions before, during and after labor. Therefore the birth trauma is **not inevitable**. At the same time the birth trauma is **possible**, because external conditions (social, economic, ecological, medical) and internal features (psychology the woman, her fears, health, the size and position of a fetus) in various combinations can block the systems of protection or fails to do its work properly.

⁵ For example, according to the statistical data in 2001 the number of normal labor in Russia has made 31,2 %, with limits of fluctuations in various regions from 10,8 % up to 54,8 %. (Sharapova 2002)

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