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First Information about Oxidative Stress Situation in Low-Risk Work

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Introduction

Oxidative stress, which is brought on by reactive oxygen species, is associated with pregnancy and childbirth. Oxidative stress has the potential to negatively affect both the course of labour and the development of the fetus. It is possible to assess the newborn's health and the possibility of pregnancy-related health issues by tracking the oxidative stress markers. As a result, research into oxidative stress throughout the physiological course of labour is the first step in understanding the role of oxidative stress in the pathophysiology of miscarriages and neonatal health issues. The study's objective was to assess how much oxidative stress was placed on mother-child pairings during physiological labour in the umbilical cord blood and venous blood. To donate venous umbilical cord blood and the mother's venous blood during the first stage of labour 128 mother-child couples were recruited to donate the mother's venous blood during the first stage of labour and the venous umbilical cord blood after the baby was born. The total antioxidant status with cofactors Mn) and glutathione peroxidase activity in venous blood plasma and umbilical cord blood were assessed. The value and Zn concentration of maternal blood plasma were much lower than those of newborn umbilical cord blood. Moms' blood, however, had far higher levels of activity and concentration than babies did. Similar Mn concentrations were found in the mother's blood plasma and the newborns' umbilical cord blood. Umbilical cord blood has higher levels of antioxidant enzymes and total antioxidant capacity, according to our findings.

Description

Physiological changes connected to pregnancy that is required to meet the demands of the developing foetus and the mother's health needs may be accompanied by oxidative stress. In females, who also use more oxygen, fatty acids are employed as the body's primary energy source, and their metabolisms accelerate faster. Substantial quantities of energy are needed to adjust the mother's body to the greater metabolic needs of a growing uterus, enlarging placenta, and developing baby. Raising the blood's oxygen content may promote the generation of free oxygen radicals, which will then promote lipid peroxidation. Free radicals and oxygen-containing molecules with unpaired electrons, known as reactive oxygen species, work as oxidising agents by taking one electron out of oxygen. The presence of mitochondria in the developing placenta also promotes the production the number of mitochondria in the developing placenta also promotes the production of these compounds. The reasons of this health inequity are believed to be changes to the health system. These elements might be organisational or behavioural .

oxygen to an electron or other molecules from oxygen Low concentrations of perform physiological functions whereas high concentrations of intra- and extracellular may result in persistent cell damage, necrosis, and apoptosis as a consequence of lipid peroxidation, protein changes, DNA damage, and altered membrane ion channel activity. By maintaining a balance between the production of free radicals and the antioxidant capacity, the body's defence mechanisms manage the oxidative stress that arises during pregnancy, sustaining the pregnancy's progress and the development of the foetus. The mother's arterial circulation filling the placenta's interstitial spaces causes physiological conditions such as hypoxia and oxidative stress during the first trimester of pregnancy. ROS and peroxides are formed as a result of the elevated oxygen pressure this condition causes. Given the second ROS are formed during the second trimester because of the baby's quick metabolism and high consumption of oxygen and fatty acids. At this point, the low flow, high blood resistance system transforms into a high flow, low resistance system. The third trimester also shows an increase in the production of hydrogen peroxide, the release of free fatty acids, insulin resistance, and fat catabolism [1,2].

Moreover, greater levels of triglycerides, total cholesterol, cholesterol, and oxidative stress markers are associated with higher levels of lipid peroxidation. At the conclusion of pregnancy, nitric oxide synthase activity in the uterus decreases. The contraction of the uterine muscle during labour reduces the flow of blood to the placenta. The uterine muscle is initially stimulated, and the production of oxytocin and prostaglandins is increased. During this time, placental artery diameter increases while vascular resistance decreases. This promotes blood flow, protects the foetus from hypoxia, and avoids reduced uteroplacental blood flow following birth [3].

It is well known that the formation of reactive oxygen species increases during pregnancy and delivery, which might result in an imbalance between pro- and antioxidants. The parameter describing the activity of the non-specific pool of antioxidants is the total antioxidant status, which evaluates the ability to protect against damage from reactive oxygen species and their derivatives. Studies have shown that TAS levels in the first trimester of pregnancy are much lower in pregnant women than in non-pregnant women. The dynamic of changes throughout pregnancy was also shown to occur in the second and third trimesters; the total antioxidant capacity of plasma increases, reaching levels equivalent to those reported in non-pregnant women in the final week of pregnancy. This condition is increased to eight weeks following delivery after childbirth. The average total antioxidant in maternal blood the mean total antioxidant status values in maternal blood were significantly lower than those in umbilical cord blood, suggesting that the antioxidant reserve may have been exhausted due to the system's decreased efficiency and increased production of reactive oxygen species. The increase in foetal antioxidant reserves at full-term delivery may be the cause of the observed differences between maternal and child levels. Other researchers that looked at that negatively correlated with made a fascinating discovery. Umbilical cord blood showed a about 20% lower concentration than maternal blood [4].

Our bodies contain a wide range of antioxidants that repair broken molecules, restrict the activity of free radicals, or stop them from being created, protecting the body from their potentially harmful effects. Metal ions including manganese, copper, and zinc have a role in hormone control and synthesis as well as acting as cofactors for antioxidant enzymes. To balance oxidative stress and manage the inflammatory response in the placental membrane, nuclear factor kappa B is produced during labour. The difference in the levels of metal ions between the mother and the foetus may lead to different patterns of the

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oxidative response as well as changes in oxidative and antioxidant markers. In our study, the mean manganese concentrations in venous blood plasma and umbilical cord blood were comparable. Tasker and associates dings [5].

Conclusion

Our investigation found differences between women with SMI and controls without SMI in the treatment routes for breast cancer at the national level in France. Providing information on care inequalities encountered by this vulnerable group, which have been ignored in health-services studies concentrating on care inequities, is an essential first step towards taking action. Additional research on causal mechanisms will help guide the development of system-level multifaceted interventions given the knowledge that the complexity associated with SMI necessitates special consideration and that improving the quality of care for this population group has the potential to make up for some of the structural health inequities they encounter throughout their lives.

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