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Different effects of pregnancy on fetus and mother

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Abstract. With the rapid development of contemporary society, an increasing number of women are choosing to give up childbirth. As women increasingly occupy prominent positions in society, they often lack the time required to raise children. Conversely, some individuals suppose that giving birth to a baby is a painful process that can deplete a woman's vitality.They opt to avoid pregnancy to maintain their well-being and minimize the physical and emotional distress they might otherwise experience. Therefore, the fertility rate in many countries is declining steadily. This paper explores the current needs for humans to transmit their knowledge and experiences to future generations. What's more, the approaches employed in this paper include literature review, comparative analysis and induction. The comprehensive study of this paper determines that female reproduction benefits human evolution and can enhance maternal lifespan. However it also highlights the potentical risks associated with this process, including the development of debilitating and irreversible conditions such as Arthritis and Preeclampsia.

Keywords: pregnancy, evolution, women, parasitism.

1. Introduction

In the natural world, more fertility typically corresponds to a reduced lifespan. However, this pattern does not hold true for human beings. Women tend to have a rather long lifespan due to their fertility, but their average health is worse than average level [1]. Postpartum, mothers may have a range of ailments including high blood pressure, arthritis, osteoporosis, preeclampsia.

On the other hand, pregnancy also offers certain benefits to the mother, such as elevated levels of oxytocin and increased bone density.

Some scholars have noted that during pregnancy, the fetus will selectively absorb nutrients from the mother when the mother's metabolism is impaired. Moreover, the placenta contains a unique chemical that is similar to the secretion of parasites, which helps protect it from the mother's immune cells. In contrast, some researchers suggest that pregnancy enhances the release of oxytocin, a hormone that decreases with age. They argue that in the event of pregnancy, oxytocin can help in rejuvenating a woman. In addition, the rate at which telomeres shorten is reduced in the DNA of mothers with more children. This paper holds great significance as it can help in developing an optimal reproductive program for their species and exploring the advantages and disadvantages of maternal pregnancy.

This paper aims to address the effect of human reproduction on the process of evolution.

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2. Literature review

This paper will start with a natural species of fish that reproduce through sexual parasitism ---angelfish. They reproduce through sexual parasitism. The male dives immediately into his mate's body without her being able to choose, then merges his own blood vessels and skin with her, all the while feeding on his mother tongue. This sacrifice of the male's life in exchange for the spread of DNA makes them the most efficient breeding machines[2]. In this way, following parasitism from the mother, only the reproductive organs will mature, while the rest of the male will degenerate, completely without independent personality, only as a sperm factory for reproduction. One question that needs to be considered is whether humans, especially women, will sacrifice themselves for the sake of future generations.

Humans are the only species in which the mortality-morbidity paradox has been observed. In women, a possible explanation for this phenomenon is that women are naturally at higher risk for arthritis than men, and the occurrence of arthritis is directly related to female hormones [3]. During a woman's pregnancy, this phenomenon happens due to a side effect of the necessary response of the pelvic ligaments to hormones. But when it comes to the definition of sexual reproduction, which is considered to be a mechanism that benefits both the group and the individual, this seems to be the opposite of the pregnancy-related illnesses mentioned above. If human reproduction was beneficial for the population and not for the individual, not many people would want to have children. In a 1969 paper, the authors bluntly named the fetus a parasite. He pointed out that when the mother is malnourished, the fetus can act like a parasite and have priority over the nutrients in the blood [4]. Other studies have shown that the placenta contains a specific molecule found in filaria parasites that helps them evade the host's immune system, a phenomenon known as pre-eclampsia. If the lining of the placenta fails to help the fetus fend off the mother's immune cells, the mother will launch a relentless attack on the fetus, a mechanism that can cause irreversible damage to both mother and fetus [5]. Currently, the only way to treat the disease is to separate the placenta from the mother. Therefore, the relationship between the fetus and the mother is not completely parasitic, but a special symbiosis. The babies definitely benefit, but the mothers do not, and that is what we are going to talk about.

Many studies have produced conflicting findings regarding the benefits to the mother. They were divided into two parts: benefit and victimization. Regarding the number of offspring, according to a study of 2006, one child reduces a mother's life expectancy by an average of 1.82 years. But in the same year, maternal life expectancy in a region of the United States increased with the number of children it had, falling off a cliff only after 14 babies were born [6-7]. Researchers also found that, in Rotterdam, women who gave birth to two or three children had a significantly lower death rate compared to those who did not [8]. Others have found that the greater the number of children, the higher the level of oxidative damage to DNA [9]. That means an increased risk of cancer, Alzheimer's disease, and accelerated aging. Curiously, in the same year, a study of women's telomeres showed that the more children that mothers had, the slower their telomeres shortened [10]. It means they are likely to live longer. These various conflicting statements make it impossible to get a definitive answer. An antagonistic hypothesis of pleiotropy in biology asserts that if a mutation leads to earlier or more frequent childbearing, it will favor that gene, even if it results in an earlier death. A study in 2023 supported this hypothesis, finding that the more powerful a person's reproductive genes were, the less likely they were to live to age 76 [11]. Thus, after all the analysis of the problems of reproduction and longevity, there is still no clear understanding of the nature of this relationship, which can be positive, negative, or non-existent. In general, deliver a baby includes too many variables such as the economic conditions of the mother, the food she ate, how long the interval between pregnancies was, and even the sex of the baby.

3. Result

However, this inquiry can still seek a response from an alternative perspective. It is unnecessary to limit the discussion to the impact of the fetus on the mother. We should also include the influence of the newborn infant on the mother. Babies have elevated concentrations of oxytocin in their blood, which is a key hormone for combating the aging process. Oxytocin, on the other hand, declines as one gets older. It

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has been verified that oxytocin levels in women are three to four times higher than normal during pregnancy. Pregnancy involves a special blood-sharing system between the fetus and mother, potentially resulting in a rejuvenating effect on the mother. Numerous studies have been conducted on the practice of transfusing blood between individuals. Many experiments have shown that the blood of mice can effectively revitalize the tissue of elderly mice [12].

There is an occurrence of a similar case. A group of Israeli scientists conducted a study on the regenerative capabilities of the liver, focusing on pregnant geriatric mice. They discovered that these mice were able to recovered 96 percent of their liver volume within two days, but non-pregnant mice only regained 46 percent. In addition, they have conducted research on the circulatory system of pregnant women, specifically focusing on the sixth week of pregnancy. They have seen a continuous increase in fetal cells in the bloodstream, a phenomenon known as microchimerism. This process helps the mother in wound healing and combating inflammation [13]. Remarkably, a fascinating outcome of pregnancy is the occurrence of tissue rejuvenation in the mother's body. To be specific, the mother gives life to the fetus, while the fetus helps the mother in rejuvenating her youth, much like two people supporting each other during challenging times. The solution to the problem appears to have been identified in this instance. A groundbreaking discovery will be made by a scientific publication in the year 2023. It refers to a biological age that is determined by indicators such as DNA methylation, and it represents the actual state of health of the human body. This biological age increases rapidly during pregnancy, which means that the body ages at a faster rate, but this is accelerated aging process is reversible [14]. In other words, the mother can regain her youthfulness after giving birth to a child. Furthermore, people who were obese before pregnancy experienced a considerably lower level of recovery compared to individuals of normal weight after giving birth, and mothers who exclusively nursed also experienced a more favorable recovery outcome [15].

4. Discussion

From a scientific perspective, pregnancy is considered a strategic mechanism in the process of human evolution. To understand human reproduction, two species are supposed to be examined, which engage in distinct reproductive methods. Rabbits and elephants possess distinct reproductive abilities, so what accounts for their coexistence and non-extinction? This is because all living organisms are using two effective reproductive strategies. In this paper, rabbits employ the R strategy (abbreviated from Rabbit), which entails a short gestation period, high fecundity, and relatively high offspring mortality. This strategy emphasizes rapid iteration. On the contrary, elephants adhere to a reproductive approach known as E(abbreviated from Elephant), characterized by a limited breeding rate, meticulous nurturing of each offspring, a low rate of offspring mortality, and communal longevity. Species that follow the R strategy face adverse evolutionary pressures due to their high population density. The rapid growth of their offspring, which outpaces the parents' death, leads to a scarcity of habitat and food resources. Elephants do not have this pressure, and their reproductive behavior is advantageous regarding evolutionary rewards. Having a hypothesis, it is detrimental to the population when a rabbit becomes pregnant later in its life, as younger rabbits do not have access to the same resources. However, an older and dependable elephant becoming pregnant later in life is beneficial to its herd, as it takes a considerable amount of time for the young to reach sexual maturity. The presence of numerous young individuals is advantageous for the overall population, as older elephants are capable of safeguarding and providing protection to the younger members of their familial unit.

5. Conclusion

Based on the above analysis, human reproduction can be considered as a process of evolution. The relationship between a mother and her fetus is neither parasitic or simple symbiotic relationship, nor is it a situation of zero-sum game. Mother are not harmed, on the contrary, they get stronger. The mother possesses the ability to rejuvenate herself by extracting vitality from the fetus' blood, while the great mother provides a nurturing environment for the fetus' maturation and progress. Survival and life are two different concepts, and human reproduction is important for evolution by reducing mortality rate.

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However, it is essential to note that mothers have higher morbidity, and many pregnant women suffer from irreversible sequelae and various infections after childbirth. Mothers possess immense power due to their ability to endure the most perilous aspects of life and acquire the most robust physical capabilities through evolution. Additionally, they possess the unique ability to produce milk fortified with their immune defenses, nurturing the future defenders of the population. Furthermore, mothers possess the strength to confront and triumph over pain. However, this paper does not conduct data analysis on specific cases of benefits and disadvantages of female pregnancy, nor does it perform specific analysis on pregnancies in specific different regions and physical conditions. This is due to the significant challenge of finding two pregnant women with identical conditions worldwide, as well as the multitude of variables related to pregnancy, including age, ethnic region, dietary habits, and economic status. Further researches has the potential to devise more effective experimental techniques to resolve this enigma.

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