THE UNDERFUNDING AND COMPLEXITIES OF FEMALE REPRODUCTION AND REPRODUCTIVE HEALTH

Introduction

Female reproduction, and reproductive health by extension, can be viewed from many different angles. The most neutral being the science and inner workings of the many biological processes, including but not limited to how hormones are affected, the risks that affect pregnancy that may or may not be intentional, the disorders that can weigh on women for their entire lives, and what has come out of the scientific research community. The complex nature of this subject is significant and may take much longer to map and gain a full understanding.

The scientific view on this subject is important because there are so many misconceptions that stem from the lack of education on reproduction, especially for females. Even within the scientific community, there is a minuscule amount of research regarding how women are supposed to deal with certain risks and disorders over a longer period of time.

A more well-funded research bond would be beneficial for the development of women's health and education.

Risks Of and During Pregnancy

The risks of pregnancy and female reproduction are vast and never ending, just like the factors that may led to even more. First off, there are many factors that could lead to pregnancy complications, like obesity, high maternal age, and endocrine disrupting chemicals.

According to Galbraith, in Medical Selection of Life Risks, "Obese women are significantly more likely to have pregnancy complications, but the incidence of complications is not associated with gestational weight changes," (2000). There are also pregnancies complications associated with obesity, such as gestational diabetes, non-insulin dependent diabetes, and pre-eclampsia.

A higher maternal age will ultimately lead to birth complications, including but not limited to spontaneous abortion. The mortality rate is high for women above age thirty, but younger maternal ages have the highest mortality rate,

especially younger than sixteen-year-olds, according to the Medical Selection of Life Risks (2000).

Spontaneous abortion, also known as a miscarriage, is when the fetus dies without the mother's consent before becoming a viable fetus, which is usually at twenty weeks or five hundred grams, according to Agarwal, A. and their research team in The Effects of Oxidative stress on Female Reproduction (2012). This envelops from 8% to 12% of pregnancies in the United States. 50% of the time, this is caused by chromosomal abnormalities of the fetus, but other causes of this are congenital anomalies, infection, diseases, and uterine anomalies.

According to Medical Selection of Life Risks, hypertension is an abnormal increase in blood pressure (2000). Chronic hypertension occurs in seven to ten per one thousand pregnancies, and pregnancy-induced hypertension occurs in thirty-six to thirty-eight per one thousand pregnancies. Pregnancy-induced hypertension, on the other hand, occurs in thirty-six to thirty-eight per one thousand pregnancies.

Endocrine Disrupting Chemicals, also known as EDCs, are natural chemicals that can severely affect a person's hormone if exposed for an extended period of time. According to D. Caserta in Environment and Women's Reproductive Health, EDCs have trans-generational effects, including reduced fertility and fecundity (2011).

Disorders with No Viable Answers

There are many disorders associated with female reproduction, such as PCOS (Polycystic Ovary Syndrome), Recurrent Pregnancy Loss (RPL), Pre-term labor, and preeclampsia. These disorders aren't curable, but will affect a women for her whole reproductive life.

Polycystic Ovary Syndrome, also known as PCOS, is a disorder that affects over five million women in the United States, according to the Center for Disease Control (2022). PCOS can affect the amount of pain a woman is in during her period, as well as the frequently of the period. PCOS also affects a woman's fertility. This disorder is extremely hard to diagnose, as no one knows what the cause is and the procedure is very painful and traumatizing.

Many women struggle with multiple miscarriages, and about five long-term miscarriages in a row is classified as recurrent pregnancy loss, according to The Effects of Oxidative Stress on Female Reproduction (2012). RPL affects about two percent of women in the United States. In about fifty percent of cases, a cause is able to be identified, leaving the other fifty percent with undetected causes.

Although genetic polymorphism of antioxidant enzymes have been associated with an increase in chance of experiencing recurrent pregnancy loss, nothing is one hundred percent certain in the research done by Agarwal, A. and other researchers.

"Preterm labor occurs 37 weeks before (about 8 and a half months) of gestation and is the leading cause of perinatal morbidity and mortality worldwide," states Agarwal et al (2012). This occurs in five percent to twelve percent of pregnancies. There are two types: indicated and spontaneous. Indicated means that the pre-term labor was predetermined, usually due to maternal and/or fetal reasons. Spontaneous, on the other hand, occur because the mother usually has uterine overdistension, ischemia, cervical disease, endocrine disorder, and more.

Preeclampsia starts to take affect around twenty weeks of pregnancy as a type of severe hypertension and high blood pressure. Agarwal et al. found that "it is a leading cause of maternal and fetal morbidity and mortality worldwide, occurring in three percent to fourteen percent of pregnancies," (2012). Preeclampsia in the early stages looks like elevated levels of protein carbonyls, lipid peroxides, nitrotyrosine residues, and DNA oxidation.

"Solutions" – Needs More Research

Fertility solutions are few and far between, and most of them have been inconclusive or failed. One solution is Creating eggs from embryonic stem cells, which are the inner cell mass of an early stage of a developing embryo. But in Eggs from Embryonic Stem Cells- an Emerging Tool to Identify Female Reproductive Risks? (2008), Greenlee states that "Efficiency is low. Less than 5% of the ES cells in the starting population display germ cell or gamete markers." Greenlee concluded that there is so little efficiency to be viable as is, but more research done by more ethical means would yield more benefits. There is no continuation of this research available in the public domain.

On the other hand, the flavor compound (catechins) in green tea may have the potential to enhance ovulation and reduce cyst formations in women with disorders such as PCOS, endometriosis, and dysmenorrhea. Kamal in Beneficial Effects of Green Tea Catechins on Female Reproductive Disorders: A Review stated, "Thus future clinical intervention studies are needed to provide clear evidence of the green tea benefits will regard to these diseases," (2021).

M. Simoni and other researchers in Functional Genetic Polymorphisms and Female Reproductive Disorders: Part 1: Polycystic Ovary Syndrome and Ovarian Response (2008), states that "The FSHR [the receptor for stimulating hormone]

gene may play a significant role in the success of ovarian stimulation and can be used a marker to predict difference in the FSHR function." Although this is a significant connection, researchers still do not know how or why this gene connects. Instead of finding something that could be used to diagnose PCOS without an invasive procedure, studies ended inconclusive towards that goal.

Limitations in Research

Specific definitions of different hormones were difficult to find in simple terms that were easy to understand without much previous biology and chemistry background knowledge. This has made most research hard to read and understand, especially in academic studies.

Although the scientific lens gives a large amount of information on female reproduction, a political and historical lens would be beneficial in order to expand. The historical aspect of this lens has the potential to show what women with certain disorders, like PCOS and preeclampsia, have done throughout history, especially without the use of modern medicine. This would be the same with women who have dealt with the hard risks of pregnancy, like spontaneous abortion, hypertension, etc. The political aspect of this lens would show how women continue to react towards laws defining the processes behind women's healthcare, such as the 2022 overturning of Roe V. Wade, which allowed states to make abortion illegal. From these standpoints, history and politics is very intertwined with science.

Unfortunately, since the solution is focused specifically on women's reproductive health studies and their funding, not much else can be covered. If money permits, other organizations could vote to use the money saved for unnecessary practices in order to fund their cause.

Research was limited, mostly because of the thousands of multi-hundred-page textbooks, that were either too long and would be time consuming to read, were hidden behind a pay wall, or both. There were very few academic articles and studies found that were fast reads, as well as completely free.

Conclusion

The consequences of purely having a female reproductive system are very large, with the little solutions stemming only from failed research are the only studies available in the public domain at this point. This is a very serious issue and

should be treated as such. Discussion from now on should consider that there is a considerable lack of knowledge of female reproductive disorders and risks, as well as how to deal with them. Any further conversations about such a topic should also consider if women who have suffered, or are suffering, will get an easier life.

The lack of knowledge of female reproductive health stems from the clear lack of funding that is being put into researching and testing. Bringing more funding into research regarding women's reproductive health will hopefully lead to new discoveries, which would be beneficial to helping women throughout the United States, as well as the world.

Women's healthcare is not something that can or should be put to the side in terms of finding solutions, as women take up half of the world's population. There needs to be a larger money push for the funding of women's healthcare research. According to the National Library of Medicine (2023), there are whole months where there are no opportunities for grants in order to fund any research.

Throughout the history of the United States, a multitude of laws have been introduced, paid for by taxes, that no longer have any use. For example, the Small Business Administration was created as a chance to grow more small businesses in the United States, however, The Heritage Foundation (1997) has stated that 98% of small business exist with loans from the SBA. The funding from this obsolete program, as well as other, will provide millions of dollars that could go towards the research and development of women's reproductive health.

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