An Assessment of Treatment Options and Efficacy for Female Infertility

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Within the fight for reproductive rights and accessible health care lies the silent struggle of the infertile woman. Alongside actively having reproductive rights and choices stripped away and no guarantee to equitable infertility treatment access, such as insurance coverage or community health service implementation, there is little being done to highlight the gap in accessible and effective women's health care as it pertains to women striving for motherhood. This literature review was performed to highlight gaps in discourse surrounding tangible intervention and resources for women struggling with infertility. The keywords infertility, women, therapies, treatments, services, and mental health, were used to identify publications from the years 2000 to 2024. The material chosen includes appropriate diagnostic methods and how medical professionals classify infertile persons based on their needs for medical involvement for successful implantation cycles. The literature shares success rates for popular intervention techniques and support mechanisms available for women enduring infertility related stress. The outcomes of this analysis imply the importance of investment of effort into research and developments supporting the convoluted challenges of infertility for women. Additionally, there is discussion on the serially underfunded initiative that is women's health research. This is imperative to consider as future research is done to prioritize what goals are most necessary since the National Institute of Health (NIH) currently only allocates 4.4% of their research budget to the National Institute of Child Health and Human Development (Fisk & Atun, 2009).

Keywords

Fertility • Infertility • Women • Treatment • Therapies • Treatments • Services • Reproductive Health • Mental Health

Introduction

According to the American College of Obstetricians and Gynecologists, "Infertility is defined as the failure to achieve pregnancy after 12 months or more of unprotected sex for women under

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35 and after 6 months in women over 35. . .” (Kharoubi, 2021). The World Health Organization (WHO) states that 1 in 6 people globally are affected by infertility. Since 2013, infertility rates for women in America alone have trended upward consistently (Tierney et al., 2023). While a cause has not been identified because it varies significantly across different populations and individuals, infertility persists and plagues families globally. This data is aligned with recent trends of women in western cultures delaying childbirth significantly because of factors including promotion of contraceptive methods, an increase in women's education levels, and gender equity strides (Mills et al., 2011). Infertility strains the physical and mental well-being of families trying to conceive and the existing barriers to treatment exacerbate these challenges. As time goes, infertility treatment options grow and adapt in their own ways. Not only do existing methods become more successful, but new ones are also created presenting infertile people, both men and women, with a plethora of options to choose from (Singh & Dewani, 2022). However, just because these options are available does not guarantee success or access. This review will examine methods used in combating infertility globally to assess what is available and most used among infertile families. I will explain methods for diagnosis, treatment options such as In Vitro Fertilization, artificial insemination and ovulation induction, as well as psychological support available to infertile families. I will also discuss the future of global infertility research, as well as problems I would anticipate arising. Overall, this literature review will compare the various developments in infertility treatment for females and interpret the success rates to answer the question “What are the current treatment options for female infertility, and how do they vary in effectiveness?”

Methods

The literature examined for this paper focuses on female infertility and how it is diagnosed, infertility treatment options, and the success of frequently used options. There are 19 publications from the years 2000 to 2024 that were identified using EBSCO Host and PubMed, employing the search terms “female infertility” and “diagnosis,” “female infertility” and “treatment,” and “female infertility” and “mental health.” In using PubMed, the appropriately identified MeSH terms included: therapies, treatments, services, male, and female. The abstract of each publication was analyzed to categorize the literature based on discussions of infertility treatment or prevalence. These were further divided into subcategories falling underneath the topics of In vitro Fertilization, Assisted Reproductive Technologies, Ovulation Induction, and Mental Health.

Diagnostic Approaches to Female Infertility

Diagnosis is imperative for those struggling with infertility to efficiently obtain appropriate treatment. Methods for diagnosing infertility include clinical examinations that consider factors such as weight and patient health history, facilitating causal research and targeted interventions. Formal diagnosis places women experiencing fertility issues into two categories: those who can conceive with therapy and those who cannot conceive with therapy. These categories define what treatment options are available to determine next steps. The clinical diagnostic procedures include Laparoscopy, which is a series of small incisions to examine the abdomen with a camera, and Hysterosalpingography, an X-Ray procedure followed by an ultrasound examination to decide significance (The ESHRE Capri Workshop Group, 2000). Genetic testing can also be done in addition

to Assisted Reproductive Technology treatment. The categorization and diagnosis of infertility is important for families to appropriately decide what treatment route to take.

Assisted Reproductive Technologies (ART)

According to the Centers for Disease Control and Prevention (CDC), Assisted Reproductive Technologies (ART) "includes all fertility treatments in which either eggs or embryos are handled." The first ART birth in 1978 marked a revolutionary advancement in infertility treatment, contributing to its widespread acceptance and popularity (Adamson et al., 2023). In 2018 alone, an astonishing 670,000 infants were born by way of ART. The countries contributing to these numbers include "China, Japan, the United States, Russia, Spain, France, Germany, Italy, Australia, and the United Kingdom." (Adamson et al., 2023).

Two commonly utilized developments of ART are In vitro fertilization (IVF) and Intrauterine insemination (IUI). In vitro fertilization is the process of egg fertilization outside of the body. It unites the sperm and egg away from the host and, once successfully fertilized, implants it into the host (uterus) for the embryo to grow optimally. Intrauterine insemination, often referred to as artificial insemination, is a procedure that places a properly prepared sperm cell into the uterus to fertilize the egg and develop an embryo. IVF and IUI are used when conception is attainable with medical intervention.

Globally, various forms of ART are available for patients to access. There has been frequent utilization of Cross-Border Reproductive Care (CBRC)–individuals seeking treatment outside of their home country (Salama et al., 2018)–because of barriers such as policy, sexuality, religion, financial burden, or simply to access better quality services. Though ART presents itself as accessible, the underwhelming government interference by way of insurance mandates (Bitler & Schmidt, 2006) prevents it from being successful in its efforts with the current demand exceeding 10 million cycles per year (Adamson, 2023). Challenges to accessing ART services include the need for it to be funded. For ART to be readily available, third-party payers would need to pay miscellaneous costs, as opposed to regarding it as patient responsibility. This method of payment prevents people of lower socioeconomic statuses from attaining their desired treatment.

Ovulation Induction

At times, the issue for women the inability to conceive in women may be attributed to hormonal imbalances or anovulation. Ovulation can be intentionally induced with assistance from pharmacological interventions, as well as lifestyle modifications. Although the practices seem to be dated and are not as frequently used today as ART is (Lawrenz, 2023), it is still a very plausible option for those experiencing infertility. Since weight and health history are major factors in diagnosing infertility, finding solutions for extreme weight circumstances and preexisting conditions can be beneficial in improving conception capabilities. Ovulation induction medications include Clomiphene Citrate, which activates what is commonly known as "superovulation," causing more than one egg to be produced during a single menstrual cycle (Yale Medicine, 2022). There are also injectable medications that can be used as a catalyst for ovulation, "The treatment cycle begins with an ultrasound and bloodwork on day three of the menstrual cycle. Injectable medications are started on day three and are continued for six to 10 days, depending on response" (Yale Medicine, 2022). In

addition, stress is known to impact the female endocrine system significantly and therefore, the reproductive system and the process of menstruation. At times, this stress can be a result of previous unsuccessful attempts with infertility treatment, or coupled with the trial (Yin et al., 2023). Mindful behaviors such as changing eating habits and being active daily can be an indirect catalyst in boosting probability of conception.

Success Rates

ART treatments are successful and have a 70% success rate globally, according to data collected from ART Fertility Clinics between 2017 and 2022. According to Yale Medicine, Ovulation Induction interventions have an overall success rate of 20 to 25%, which does not deviate much from the natural probability of conception for women with no fertility problems.

Psychological Support

Recognizing the mental health challenges faced by women experiencing infertility is crucial. As previously mentioned, stress can cause hormone imbalance and therefore irregular ovulation (Yin et al., 2023), which contributes to the inability to conceive. Approaches to bridging the gap between women experiencing infertility and the necessary attention to their mental health include group therapies and digital services. A study done to examine how group therapy interventions supported women struggling with infertility found that psychological intervention in group settings "improved the mental health, fertility stress and pregnancy rates of women with infertility" (Warne et al., 2022). Web applications are also innovative as an outlet for women seeking support (Park et al., 2021). The lack of intervention within the realm of mental health challenges for persons experiencing infertility was temporarily mitigated in 2018–19 and organized to provide education of infertility and allocation of resources. After proper implementation and trial, the data reported the highest at "3.19 points for the suitability of information, followed by 3.17 points for usefulness of information, 3.16 points for design, 3.13 points for information efficiency, and 3.20 points for convenience" (Park et al., 2021).

Discussion

According to the CDC, the US fertility rate has decreased to a historic low. As many countries experience significant demographic shifts from declining birth rates, infertility is becoming an increasingly pressing health and policy issue (Nargund, 2009). The fight for accessible healthcare is already underway with more treatment options becoming available as society advances. As society advances, more treatment options will be made available, and the fight for accessible healthcare is already underway. Women's health research has been identified as substantially underfunded, with the National Institute of Health (NIH) allocating fewer resources to the study of diseases disproportionately impacting women despite considerable participation by women (Mirin, 2021). To provide context, the 2007 NIH budget for the National Institute of Child Health and Human Development was $1.26 billion, which is only 4.4% of their overall financial contributions to research (Fisk & Atun, 2009). Increasing research investment in both the causes of infertility and effective treatment interventions is critical for addressing this international concern. The success

rates of these treatment options vary significantly across options available to the average woman seeking intervention with ART having a 70% success rate as of 2022, and Ovulation Induction having a success rate of between 20–25%. This disparity is relevant and should be considered when diagnosis-based treatment assigning is done. The National Institute of Health lists "Can age-related infertility be prevented?" and "Can a predictive model for fertility based upon ovarian reserve tests be developed, tested, and validated?" (Duffy et al., 2021), under its top 10 research priorities for female and unexplained fertility.

Looking at the bigger picture of global infertility, access to resources available for treatment and mental health support of those endeavoring to overcome this barrier in their efforts to become parents are also important issues to address. Support for women seeking assistance during their treatment journeys should be a central focus of future research and funding initiatives in infertility. As previously stated, most of the disconnect between patient and intervention lies in the lack of financial assistance available. Initiatives like donor funds for women have the potential to be impactful, specifically for the more successful Assisted Reproductive Technologies. Mental health support is also imperative and requires a more serious investment of attention and funds for continuous group therapies, online platforms, and built-in benchmarks for women seeking and undergoing treatment.

Conclusion

Overall, the literature presented is effective in understanding the present treatment options available for women dealing with infertility. A useful intervention could be established in trying to understand more about the root cause of infertility, whether it's singular or intersectional. The material proficiently expanded on Assisted Reproductive Technologies and Ovulation Induction, both of which are globally used. Accessibility by all is still a point to be improved, specifically ART treatments which have a 70% success rate globally. The examination of content is successful in answering the proposed question, "what are the current treatment options for female infertility, and how do they vary in effectiveness and accessibility?" The mental health of women battling infertility should continue to be monitored to define the correlation of stress and depression with infertility. As researchers advance their studies, it is imperative to analyze women's reproductive health ethically and with respect for established best practices

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