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Brain and Fascia, the Missing Link in Clinical Reasoning of Reproductive Function: Persian Medicine Approach

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Abstract

Context: Infertility is a significant global concern that causes stress in families, necessitating broader studies on infertility management due to its increasing prevalence.

Evidence Acquisition: Obesity is a notable risk factor for infertility or dysfunction in the reproductive system. Persian medicine (PM), as one of the complementary and integrative medical systems, highlights the connection between abdominal organs and the brain.

Results: This study utilized the works of Avicenna, Razi, and Ahvazi to explore personalized indicators of clinical reasoning in various infertility conditions. The PM practitioners emphasized two primary considerations in the clinical reasoning of infertility: The brain and abdominal fascia, where pathological changes in one could directly affect the other, potentially contributing to infertility. A key element in this connection is Maraqq, a membranous structure (part of the fascia) in the abdomen, analogous to the parietal peritoneum in modern terminology. Maraqq plays a role in digestion, breathing, and fertility. Disturbances in the brain and Maraqq may have adverse effects on fertility.

Conclusions: Treatment strategies in PM appear to leverage the brain-abdominal fascia connection (Maraqq or peritoneum) to address infertility.

Keywords: Clinical Reasoning, Brain, Infertility, Persian Medicine, Abdominal Fascia

1. Context

Infertility, defined as the inability to conceive after a year of regular, unprotected sexual activity, can cause significant stress in many families. Broader studies are essential to develop new approaches to infertility due to its increasing prevalence. Accurate clinical reasoning has gained prominence in infertility treatment because of the high diagnostic and therapeutic costs associated with the condition. This study focuses on dysfunctions related to infertility, particularly obesity, which is a major risk factor for impaired reproductive function and overall reproductive health (1).

Persian medicine (PM), a complementary and integrative medical system, offers valuable insights into patient management and decision-making through clinical reasoning. Hippocrates, a renowned Greek physician, also emphasized the brain's influence on reproductive organs and its connection to semen production, highlighting the importance of clinical reasoning in understanding reproductive health (2). The PM physicians have historically employed various methods for clinical reasoning in treating diseases, some of which have been validated through practical experience. For instance, addressing abdominal obesity and its links to abdominal fascia and brain function has demonstrated positive outcomes in infertility treatment. Medieval Persian scholars like Razi, Ibn Sina, Ahwazi, and Ibn Nafis explored clinical reasoning in infertility, focusing on sperm and ovary dysfunctions and their relationship with weight conditions (3).

Contemporary studies indicate that hormonal imbalances play a critical role in obesity and infertility. Similarly, PM texts recognize the link between obesity and infertility. Research shows that abdominal obesity can disrupt hormonal balance, affecting leptin,

adiponectin, ghrelin, neuropeptide Y, and agouti-related protein. These hormonal disruptions impair brain function and reproductive health (4). Additionally, pro-inflammatory substances such as advanced glycation end products (AGEs) and monocyte chemotactic protein-1 (MCP-1) have been identified as contributors to ovarian dysfunction associated with obesity (5).

Fascia, as a system connected to fertility through the central nervous system (CNS), has been emphasized in ancient infertility resources. Medieval Persian literature clearly links weight changes and fat accumulation with infertility and impotence through connections between the brain and the peripheral nervous system (PNS) (6). Complementary medicine, when applied with accurate clinical reasoning, is crucial for diagnosing and managing infertility in individuals with abnormal weight (obesity or thinness) (7).

This study aims to elucidate PM's perspective on the connections between the brain and fascia, which offer an inclusive approach to understanding infertility. The fascia (peritoneum or Maraqq) is presented as an essential pathway or pathological site in infertility diseases (2). Additionally, the hypothesis is proposed that reducing abdominal fat through lifestyle medicine could improve reproductive system function.

2. Evidence Acquisition

This article is based on library research and was conducted in several steps. The process included identifying keywords, searching sources, categorizing, organizing, and comparing findings. In this study, the books of Avicenna (Al-Qanun fe al-Tibb), Razi (Al-Havi), and Ahvazi (Kamel al-Sanaah al-Tibbiyah) were utilized to examine personalized indicators of clinical reasoning in infertility conditions associated with abdominal obesity.

3. Fascia (Peritoneum or Maraqq) Function and Routes in Persian Medicine

Fascia is a subset of the nervous system, and its function is closely related to the brain. Fascia branches connected to the brain extend toward the breast, uterus, kidneys, testes, ovaries, heart, liver, lungs, intestines, and umbilicus. One of the links in this association is the peritoneum or Maraqq. This membranous structure, which is a part of the fascia located in the abdomen, is involved in digestion, breathing, underweight conditions, and fertility (8). According to the PM perspective, fascia operates in the body through three mechanisms:

3.1. Fascia Function in Food Digestion

The digestive tract is surrounded by the parietal peritoneum, also known as the external layer of the peritoneum. A patient with dysfunction in any of the digestive organs, such as the stomach, liver, spleen, or intestine, may experience Maraqq-related symptoms, which are described in detail in PM texts.

3.2. Fascia Function in Respiratory Organs

According to ancient PM medical texts, the fascia originates in the chest. The connection between obesity and respiratory problems highlights a strong link between the respiratory organs and the chest fascia (9).

3.3. Fascia Function in Reproductive Organs

Attention to communication plays a critical role in reproduction, as this active organ can influence the function of the upper viscera it affects, including the lungs, heart, intestine, stomach, kidneys, uterus, and ovaries. According to PM, a disconnection of Maraqq in the organs within this sub-category of interest can lead to infertility.

4. Discussion

In this study, we aimed to articulate the clinical reasoning methods of PM physicians, who have consistently emphasized the importance of lifestyle, particularly in addressing infertility. Persian medicine sources highlight the role of abdominal obesity in the occurrence of infertility. The clinical reasoning of infertility in PM involves examining the conditions of both the CNS and PNS simultaneously, with a focus on the state of the fascia (peritoneum and Maraqq). This approach underscores the significance of assessing the abdomen as part of the PNS, a perspective emphasized by past physicians (8).

Persian medicine practitioners believed that pregnancy conditions and fetal maintenance were closely linked to the neural communication network between the brain and associated reproductive organs. Any disturbance in this network could result in reproductive dysfunction. Based on this relationship, as discussed in previous studies, numerous brain-related conditions, such as sexual headaches and uterine epilepsy, can be effectively managed (10-12).

The therapeutic models employed by PM physicians for treating obesity have also proven effective in addressing infertility. For instance, cupping therapy applied to the abdominal area, which facilitates weight reduction in that region, has been associated with an

increased likelihood of fertility. These therapeutic models in PM have been rigorously utilized for weight management, suggesting that, since obesity is a known cause of infertility, such methods may also enhance fertility. Disruptions in communication within this area, caused by obesity or an underweight abdomen, can lead to infertility. By implementing various treatment measures in this field while simultaneously strengthening brain function, PM approaches may improve reproductive outcomes.

Several treatments mentioned in this context originate from medieval Persian sources, including cupping, topical drugs, massage, and medicinal oils (Table 1) (13, 14).

Table 1. The Approach of Treatment Options in Razi's Books Based on Clinical Reasoning

Different Treatments for Weight Problems Based on PM Textbooks	Sources
Abdominal obesity	Thinness
Massage	Topical drugs
Cupping	Financial oil
Financial oil	Gentle massage

Abbreviation: PM, Persian medicine.

According to ancient texts, brain-related infertility arises from the dysfunction of organs surrounded by Maraqq. Obesity or being underweight contributes to infertility by causing weakness or dysfunction in the parietal and visceral peritoneum. Persian Medicine sources also emphasized six principles of a healthy lifestyle that support fertility. These principles include physical activity, nutrition, environmental conditions, body cleansing, mental and emotional states, and sleep and wakefulness. Adjusting these six principles can help mitigate the inflammatory processes associated with obesity. By implementing targeted strategies within these principles, abdominal obesity can be reduced, the abdominal fascia can be strengthened, and fertility can be improved (8, 13, 14)

4.1. Conclusions

In this review, we presented brain-related infertility based on PM literature. As this study was a review and library-based research, it did not encounter any limitations. Although various treatments for infertility are mentioned in PM texts, further investigations through clinical trials are necessary to validate their efficacy. It appears that modifying lifestyle in accordance with the principles of Iranian medicine can enhance individuals' fertility. We advocate for physicians to emphasize lifestyle factors in their clinical reasoning and decision-making processes concerning patient care.

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