

Common Gastrointestinal Disorders in Infants from the Perspective of Persian Medicine

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Abstract

Background: The diagnosis and treatment of gastrointestinal disorders in infants have a rich historical background within medical systems. A key aim of this research is to explore the historical development of these conditions within the framework of Persian Medicine (PM).

Materials and Methods: This study draws upon established diagnostic and therapeutic approaches for prevalent gastrointestinal disorders in infants, referencing authoritative PM texts, including Al-Hawi by Razi (854-925 AD), Kamel al-Sanaa al-Tebiya by Ahwazi (10th century AD), Ibn Sina's Canon of Medicine (980-1037 AD), Kholasa al-Tajarob by Baha al-Dawleh Razi (died 1508 AD), and the Kholasa al-Hekma by Aghili Shirazi (18th century), alongside relevant findings from contemporary medical databases.

Results: A number of PM practitioners have associated teething and weaning with diarrhea, while they have interpreted constipation accompanied by pale stools as indicative of obstruction of biliary ducts and impaired bile flow into the intestines. Symptoms such as nocturnal teeth grinding and drooling during sleep have been regarded as potential indicators of gastrointestinal parasitic infections in infants, with various treatment options proposed for each condition.

Conclusion: Iranian scholars have endeavored to accurately diagnose gastrointestinal disorders by focusing on clinical evidence. Acknowledging the delicate nature of infant physiology, they have employed simple, accessible, and safe treatment methods, such as dietary modifications. A more in-depth investigation of PM regarding gastrointestinal disorders in newborns is suggested.

Key Words: Historical Medical Texts, Mizaj (Temperament), Pediatric, Traditional Medicine.

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1- INTRODUCTION

In ancient times, as the field of medicine progressed, several distinct branches of this science emerged. Prominent disciplines included anatomy, pharmacology, gynecology, and internal medicine (1). Although infant care has been practiced since the dawn of humanity (2), the topic of pediatric diseases was frequently included within the wider context of women's diseases during the ancient times (1).

The study of diseases affecting infants and children, as well as the associated care practices, can be traced back to the ancient civilizations of Mesopotamia, India, China, Iran, and Greece (2).

The ancient Egyptians held a belief in protective deities for women and infants, with Neith being recognized as the goddess of childbirth. They emphasized the importance of breastfeeding and utilized the poppy plant to soothe colicky infants (3).

In Mesopotamia, the legal framework of Hammurabi (1792-1750 BC) included provisions not only for adult medicine, but also for the care of children (4).

In Indian medical literature, Sushruta, in the 2nd century BC, dedicated eleven out of 66 chapters of his work to pediatric care (5).

In ancient Greece, physicians such as Hippocrates (370-460 BC) and Galen (born 129 AD) paid attention to the care of infants and the diseases affecting newborns and children (6,7). Soranus, a contemporary of Galen from the 1st-2nd century AD, authored a comprehensive textbook on gynecology and obstetrics that also addressed the health of newborns. The Roman physician Oribasius (320-403 AD) also contributed insights regarding infants and the quality of maternal milk in his writings (8). Paul Ignatius (625-690 AD) addressed the topics of infant and child

care and parenting, and a work titled "On the Regimen and Therapy of Children" is ascribed to him (7).

Nevertheless, the earliest known book dedicated specifically to children, of which a Latin translation has survived, is "Fi Tadbir al-Sebyan", authored by Zakaria Razi (854-925 AD) (9).

Cyril Elgood, an English historian and physician (1892-1970), posits that Iranians are the pioneers of pediatric medicine globally, as evidenced by the writings of Razi (10). Razi is recognized as the first physician to distinguish pediatrics as a separate discipline from women's diseases (9).

This perspective suggests that an exploration of common digestive diseases in childhood within the Persian medical literature may illuminate the contributions of Persian physicians in this area, as well as the historical advancements made by various doctors in the identification, prevention, and treatment of digestive disorders in infants and children.

The Persian medical school, with eminent figures such as Razi (854-925 AD), Ali Ibn Abbas (10th century AD), and Ibn Sina (980-1037 AD), represents a synthesis of knowledge from diverse civilizations. This knowledge was enriched during the flourishing of Jundishapur University, where translations of texts from various medical schools and the migration of physicians from around the world played a significant role (11-15).

In light of these considerations, this article aims to investigate several prevalent digestive diseases in infancy, including diarrhea, colic, constipation, vomiting, and digestive parasites, which remain critically relevant today. This will provide the ground for further research of the insights of ancient physicians, thereby reviving information that has been overlooked over time.

2- METHODS

In this review study, an effort was made to identify prevalent gastrointestinal disorders in infants as documented in notable primary sources. A systematic approach was employed to search and analyze classical Persian medical texts and contemporary databases.

The primary sources were selected based on their historical significance and comprehensive coverage of pediatric gastrointestinal disorders. These works include Al-Hawi and Al-Mansouri by Zakariya Razi (854-925 AD), Kamel al-Sana'a by Ali Ibn Abbas (10th century AD), Ibn Sina's Canon of Medicine (980-1037 AD), Kholasa al-Tajarob of Baha al-Dawlah Razi (died 1508 AD), and Kholasa al-Hekma of Aghili Shirazi (18th century), among others.

For contemporary sources, electronic databases including MagIran, UpToDate, Scopus, MedLine, and Web of Science were systematically searched using keywords related to "Persian medicine," "traditional medicine," "pediatric gastrointestinal disorders," "infant digestive diseases," and "historical medical texts." The search strategy focused on articles published in both Persian and English languages that discussed traditional approaches to pediatric digestive conditions. Sources were included if they: 1) contained specific references to gastrointestinal disorders in infants, 2) provided diagnostic or therapeutic approaches from Persian medical tradition, 3) were authored by recognized classical Persian physicians, or 4) offered historical analysis of traditional pediatric medicine practices. The obtained information was then processed and synthesized to present a comprehensive overview of Persian medicine approaches to common infant gastrointestinal disorders.

3- RESULTS

Among the prevalent infantile diseases addressed in PM literature are conditions such as diarrhea, constipation, vomiting, infantile colic, and gastrointestinal parasites, which will be elaborated upon in the following sections.

3-1. Diarrhea

The therapeutic approaches employed by Persian physicians for infant diarrhea varied according to the underlying etiology.

3-1-1. Weaning-Associated Diarrhea

PM scholars believed that weaning was a cause of diarrhea in infants. To manage this condition, they recommended that the infant be reintroduced to breast milk temporarily, while avoiding laxative foods and incorporating astringent and constipating foods into their diet. Examples of astringent foods include roasted flour, dry bread, corn, and rice (16). In the Canon of Medicine, Ibn Sina (980-1037) states "When it is time to wean, the baby should be weaned gradually; abrupt weaning may lead to anxiety and confusion, with a risk of illness or even death" (17).

3-1-2. Teething-Associated Diarrhea

Albucasis (936-1013 AD), a prominent physician from Andalusia, categorized childhood into four developmental stages: the first stage is birth, the second stage is the emergence of teeth, the third stage occurs around the age of six, and the fourth stage aligns with puberty. In his renowned work, al-Tasrif, he elaborates on the ailments that may afflict children at each stage. He notes that conditions such as gingivitis, fever, convulsions, and diarrhea are prevalent among children in the second stage, attributing these ailments to the teething process (18).

PM physicians assert that infants may experience diarrhea during teething, and if the diarrhea is mild, it is considered a normal occurrence that does not necessitate treatment. However, in cases of severe diarrhea, Baha al-Dawleh Razi (died: 1508 AD) suggests that facilitating the emergence of teeth may be an effective approach to management. He proposes a remedy, seemingly derived from the works of al-Mulki Ahwazi (10th century AD) and Ibn Sina's Canon of Medicine, which advocates for the lubrication of the gums to ease the teething process and minimize gingivitis. Specifically, he recommends that when teeth are nearing eruption, the infant's head and neck should be anointed with a mixture of washed olive oil (oil diluted with water), and a drop of this oil should be placed in the infant's ear to promote the swift and gentle emergence of teeth without harming the gums (19).

3-1-3. Diarrhea from Other Causes

When diarrhea occurs due to reasons other than teething and weaning, it may be treated via the following methods.

3-1-3-1. Compresses

One of the compresses advised by Baha al-Dawleh Razi consists of a mixture of anise, celery seed, and cumin seed, slightly warmed, wrapped in a thin cloth, and applied to the infant's abdomen. Another compress recommended by him comprises a mixture of sumac leaves and crushed myrtle, soaked in vinegar, secured to the infant's stomach while warm (19).

3-1-3-2. Medicine and Food

Persian physicians employed a range of treatments for diarrhea, such as mucilage derived from the seeds of broadleaf plantain, basil, and blond plantain, on the condition that the child did not exhibit signs of a weak stomach or poor digestion. Additionally, yogurt was recognized as a beneficial food for managing this condition (20). Dried fruits,

such as apples, quince, and Russian olives, are also noted by Persian doctors for their significant role in treating diarrhea (21).

3-2. Constipation

The definition of constipation in PM, is reached by the criteria set forth by physicians regarding normal stool characteristics. According to PM scholars, a baby's stool should be uniform and yellow, neither excessively loose nor hard, and bowel movements should not be accompanied by pain. It should also be devoid of sound, foam, and should occur once per meal (19,22).

3-2-1. Etiology

In PM texts, constipation in children is referred to as "Eteqal-e tabi'yieh" and is attributed to an excess of moisture in the digestive tract and insufficient bile secretion into the intestines. Mohammad Arzani, a prominent figure from the 17th and 18th centuries, notes in his work, Mofarrah al-Qoloub, that the bodies of children possess a higher amount of moisture, which may compromise gastrointestinal function or hinder the flow of bile into the intestines, consequently leading to constipation (22,23).

3-2-2. Differential Diagnosis

As described by Ibn Salum Saleh Ibn Nasrollah Halabi (died 1670 AD) in his work "Ghaya al-Etqan Fi Tadbir al-Badan al-Ensan", he references the insights of Chaghmini (died 1345 AD). He outlines the distinguishing characteristics of constipation based on the underlying cause. When constipation arises from phlegm and excessive moisture, symptoms include abdominal and intestinal distension accompanied by hard stools. In contrast, if the condition is attributed to insufficient bile flow into the intestines, the individual may exhibit a yellowish complexion and white stools (24).

3-2-3. Treatment

In terms of treating constipation in infants, Ibn Sina recommends several methods, including massaging the infant's abdomen with olive oil, administering a suppository known as Zabal al-Far, and applying cow bile to the baby's navel (17). Aghili Shirazi (17th and 18th centuries AD), echoes Ibn Sina's recommendations but suggests a different approach for cow bile, advocating for its application as a compress on the infant's abdomen (22). Additionally, Ibn Salum proposes a decoction of cabbage extract mixed with honey for alleviating constipation in infants. In contrast, Mohammad Ibn Zakariya Razi offers an alternative perspective, advising that the mother consume wild cucumber and subsequently breastfeed the infant multiple times the following day to alleviate constipation (25).

3-3. Vomiting in Infants

PM scholars categorize the causes of vomiting in infants into three distinct groups. When this condition occurs frequently, they deem it essential to implement therapeutic interventions.

3-3-1. Vomiting Induced by Bile Reflux

This form of vomiting, referred to as bilious vomiting in PM, arises from the flow of bile into the stomach. The presence of bile irritates the stomach lining, leading to vomiting, which is characterized by the expulsion of yellow or greenish vomit. This condition may be accompanied by other symptoms including fever. In addressing this type of vomiting in the Canon of Medicine, Ibn Sina recommends the consumption of sour fruit juices and quince paste combined with clove powder, as well as the application of anti-emetic medications in the form of poultices (17). Aghili Shirazi echoes Ibn Sina's recommendations, detailing suitable anti-emetic poultices that include ingredients such as rose petals, betel nut, Indian

aloewood, and black myrobalan, which should be finely ground and applied to the abdomen with water or wine (22).

It is important to note that the efficacy of sour fruit consumption, as suggested by Ibn Sina, is not universally effective. In Kholasa al-Tajarob (Summary of Experiences), Baha al-Dawleh Razi recounts a case of a baby girl who consistently vomited after consuming stomach-irritating foods like yogurt and Doogh (yogurt drink). Initially, she expelled phlegm, followed by yellow and green bile, ultimately leading to fainting spells. Various remedies, including sour substances proved ineffective. I finally prescribed a regimen of dry bread and mint which was beneficial. I administered dry mint on several additional occasions, and ultimately, she experienced a fever, and after some time, she was completely cured. I repeated this remedy with various individuals, and it successfully alleviated their symptoms (19).

3-3-2. Acidic Vomiting

In PM, this type of vomiting is referred to as "Josha'-e hamez" (sour eructation). The primary cause attributed to this condition is the weakness of the stomach, as noted in various PM sources. To treat and prevent this disease, PM physicians advised breast-feeding mothers to refrain from consuming foods that may exacerbate stomach weakness. Foods such as yellow plums, watermelons, and fatty foods fall into this category. Additionally, a decoction of cloves in rose water is recommended for both the mother and the infant. Ibn Sina suggests applying Christ's thorn water to the baby's stomach, and also recommends reducing the quantity of food given to the infant (17).

3-3-3. Vomiting Induced by Excessive Milk Consumption

Persian physicians recommend feeding the infant smaller amounts of milk, asserting that this reduction is the most

effective treatment. If this underlying cause is not addressed, other treatments are unlikely to be effective (17,22, 23).

3-4. Pneuma Colic

Flatulence characterized by abdominal bloating, can lead to intestinal pain, referred to as pneuma colic. In this regard, Ibn Sina stated: "One of the diseases among infants is colic, characterized by pain in the intestines. Symptoms include crying and writhing. Sesame oil, wax, and warm water are used to alleviate this ailment" (17). Hakim Arzani (18th century AD) elaborated on the management of pneuma colic. He recommended the use of a poultice made from a combination of oil, warm water, and salt, contained within a cow's bladder, to be applied to the infant's abdomen. Additionally, he advised mothers to position their babies in a prostration stance across their thighs while gently massaging the child's back with violet oil to ameliorate abdominal pain (23).

In the treatment of pneuma colic, Baha al-Dawleh Razi notes that it is beneficial to rub a mixture of ajwain and egg yolk on the baby's stomach. Additionally, applying a warm compress made from fresh cow's kamyak is highly effective in alleviating intestinal pain. Recognized as an empiricist physician in PM, Baha al-Dawleh Razi documented numerous clinical observations in his writings. He recounts witnessing mothers who would lick their baby's stomach during episodes of pneuma colic, and upon doing so, the pain would cease immediately (19).

3-5. Intestinal Worms and Parasites

While contemporary medicine offers effective treatments and detailed classifications of these pathogens, PM sources provide valuable insights through the identification of symptoms that assist physicians in diagnosing parasitic infections within the digestive tract. Persian physicians categorized

gastrointestinal worms into four distinct groups based on their morphology, each associated with specific symptoms. For instance, Ibn Sina lists various symptoms indicative of digestive parasites, including nocturnal teeth grinding, nighttime drooling, dry and itchy lips during the day contrasted with wet lips at night, abdominal pain, nausea, loss of appetite, excessive hunger, weight loss, anal itching, as well as stress and anxiety (17).

Ali Ibn Abbas Majusi Ahwazi advocates for the use of mugworts, either in conjunction with dates or as an extract mixed with sugar, as an effective treatment for eliminating digestive parasites in infants (21).

4- DISCUSSION AND CONCLUSION

The prevalent gastrointestinal disorders in infants have historically posed significant challenges for parents, leading to ongoing concerns regarding their causes. Understanding the underlying factors contributing to these conditions has always been of paramount importance. With the advent of Islam, notable physicians such as Paul Aegina from the Greek medical tradition and Razi from the Persian medical school made substantial contributions to the understanding and management of pediatric diseases.

These physicians focused on identifying critical complications affecting children and sought effective management strategies. They recognized and classified issues such as diarrhea, teething difficulties, constipation, vomiting, and gastrointestinal parasites as primary concerns. By documenting clinical symptoms, they aimed to propose straightforward recommendations for treatment of these diseases. Modifying maternal nutrition and utilizing local remedies emerged as practical treatment options developed by these physicians.

This study has several limitations that should be acknowledged. First, the

historical nature of the sources limits the ability to verify the clinical efficacy of described treatments using modern scientific standards. Second, the translation and interpretation of classical texts may introduce potential bias or misunderstanding of original concepts. Third, the therapeutic approaches described were developed within specific cultural and geographical contexts that may not be directly applicable to contemporary diverse populations.

Future research should focus on several key areas: 1) systematic clinical evaluation of traditional remedies using modern research methodologies to assess their safety and efficacy, 2) detailed pharmacological analysis of herbal preparations mentioned in classical texts, 3) comparative studies examining similarities and differences between Persian medicine approaches and other traditional medical systems, and 4) development of integrative treatment protocols that combine evidence-based traditional practices with modern pediatric gastroenterology.

A thorough exploration of the diagnostic, preventive, and therapeutic approaches employed by these early medical scholars could unveil their innovative practices and offer valuable insights for families facing similar challenges today.

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6- DISCLOSURE STATEMENT

The authors report no potential conflict of interest.

7- DATA AVAILABILITY STATEMENT

Data supporting the findings of this study are available within the manuscript and its supplementary materials.

Additional datasets can be obtained from the corresponding author upon request.

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