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Intestinal Helminthiasis in Children: An Integrative Review of Contemporary Medical and Unani Perspectives on Etiology, Clinical Manifestations, Diagnosis, and Management

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ABSTRACT

Background: Soil-transmitted helminth (STH) infections and other intestinal parasitoses remain among the most widespread parasitic diseases of humankind, affecting an estimated one-fourth of the global population and disproportionately burdening children in resource-limited settings. Beyond direct morbidity, chronic worm infestation in childhood is closely linked to growth faltering, micronutrient deficiency, anaemia, and impaired cognitive development, making it an important public-health and paediatric concern in endemic regions such as South Asia.

Objective: To consolidate and critically compare the contemporary biomedical understanding of intestinal helminthic infections in children with the classical Unani (Greco-Arabic) conceptualisation of "Deedan-e-Amaa" (intestinal worms), covering aetiology, clinical presentation, diagnostic approach, preventive strategy, and therapeutic options from both systems, with a view to identifying areas of convergence that may support an integrative model of care.

Methods: This is a narrative review based on a structured search of published epidemiological and clinical literature (including PubMed-indexed journals, WHO reports, and regional public-health surveys) together with classical Unani texts of Ali ibn al-Abbas al-Majusi,

Ibn Sina, Zakariya al-Razi, Akbar Arzani, and other recognised authorities, supplemented by standard paediatric and internal-medicine textbooks. Sixty-three sources meeting relevance criteria were synthesised thematically.

Discussion: The review outlines the biology, transmission, and clinical spectrum of the principal intestinal nematodes (Ascaris lumbricoides, Enterobius vermicularis, hookworm species, and Trichuris trichiura) and cestodes (Taenia saginata and Taenia solium) responsible for paediatric helminthiasis, and juxtaposes this with the Unani nosological framework, which attributes worm formation to putrefaction of phlegm (balgham) under the influence of an abnormal internal heat (hararat-e-ghareeba) and classifies intestinal worms into three principal forms — Dawa-ul-Khul (threadworm/pinworm), Hayat (roundworm), and Habb-ul-Khura (tapeworm, itself subdivided into three varieties). Diagnostic approaches, preventive measures centred on hygiene and periodic deworming, and treatment options — ranging from conventional benzimidazole anthelmintics to a range of single Unani drugs (mufradat) and compound formulations (murakkabat) — are reviewed comparatively.

Conclusion: Intestinal helminthiasis continues to be a preventable yet persistent cause of childhood morbidity. While conventional medicine offers well-validated diagnostic and pharmacological tools, classical Unani literature independently documents a coherent clinical description and a broad anthelmintic pharmacopoeia that merits further pharmacological and clinical validation. An integrative approach combining public-health deworming strategy with evidence-based evaluation of traditional anthelmintic formulations may offer a more comprehensive strategy for control of this condition in endemic populations.

Keywords: Soil-transmitted helminths; Intestinal worms; Deedan-e-Amaa; Unani medicine; Anthelmintic; Ascariasis; Enterobiasis; Hookworm; Children

1. INTRODUCTION

Soil-transmitted helminth (STH) infections form a group of parasitic conditions caused principally by the intestinal roundworm Ascaris lumbricoides, the hookworms Necator americanus and Ancylostoma duodenale, and the whipworm Trichuris trichiura. They constitute one of the most common infectious burdens on humanity: current estimates suggest that more than 1.5 billion people — roughly a quarter of the world's population — harbour one or more of these parasites [1,2]. Transmission is concentrated in tropical and subtropical regions with inadequate sanitation, with the heaviest burden falling on sub-Saharan Africa, the Americas, China, and East Asia. Over 270 million pre-school children and more than 600 million school-age children live in areas of intense transmission and require regular treatment and preventive intervention [1].

Because intestinal parasites compete directly with the host for ingested nutrients, heavy or prolonged infestation in young children is strongly associated with growth impairment and specific nutritional deficiencies, including vitamin A deficiency, protein-energy malnutrition, and iron-deficiency anaemia [2,3]. Intestinal parasitic infections as a whole are estimated to cause clinical morbidity in some 450 million people, a large proportion of whom are children in developing countries; infection with Ascaris, hookworm, Hymenolepis nana, and Trichuris is closely tied to poverty, unsafe water, and poor sanitation and hygiene [4]. The resulting effects — diminished physical fitness, growth retardation, delayed cognitive development, and nutritional anaemia — place pre-school and school-age children at the highest risk of morbidity, and reducing this burden to a level at which it no longer constitutes a public-health problem remains a stated goal of global helminth-control programmes.

Helminthiasis is, above all, a disease of poor sanitation, and its control depends as much on environmental and personal hygiene as on pharmacological treatment; well-nourished individuals frequently harbour helminths with little apparent inconvenience, whereas the consequences are considerably more severe in malnourished children [5]. Infection is particularly common in children below two years of age who walk barefoot, and ascariasis may occasionally affect infants as young as one to two years; children of lower socio-economic status between one and five years of age are the group most affected. Intestinal nematode infections — hookworm disease, ascariasis, enterobiasis, trichuriasis, and, less commonly, other nematodiases — are prevalent across temperate and tropical regions, particularly wherever overcrowding and inadequate sanitation coexist. Ascariasis alone infects close to one-fourth of the world's population, with pre-school children especially vulnerable because of hand-to-mouth behaviour and the ingestion of contaminated fruit and vegetables

Unani medicine, an ancient system rooted in Greco-Arabic humoral theory, independently describes this group of conditions under the heading of Deedan-e-Amaa (intestinal worms) and offers a detailed classical account of their causation, clinical types,

and treatment. The present review brings together the contemporary biomedical literature and the classical Unani corpus on intestinal helminthiasis in children, with the aim of providing a single, comparative, and clinically useful reference for practitioners of both systems.

2. MATERIALS AND METHODS

This article is a narrative (non-systematic) review. Relevant biomedical literature was identified through the peer-reviewed journal articles, WHO resources, and standard textbooks of paediatrics, internal medicine, community medicine, and parasitology referenced at the end of this article. Classical Unani source texts — including Kamil-us-Sana'ah of Ali ibn al-Abbas al-Majusi, Al-Qanoon fit Tibb of Ibn Sina, Kitab-ul-Hawi of Zakariya al-Razi, Tibb-e-Akbar and Mizan-ut-Tibb of Akbar Arzani, and other recognised Unani compendia — were consulted for the traditional description of Deedan-e-Amaa. A total of 63 sources were reviewed and synthesised thematically under the sections that follow; because the review draws on both epidemiological survey data and classical descriptive texts, no formal quality-scoring or meta-analytic method was applied, consistent with standard narrative-review methodology.

3. EPIDEMIOLOGY AND GLOBAL BURDEN

STH infections show a markedly uneven global distribution, concentrated wherever poverty, inadequate sanitation, and warm, moist soil conditions coincide. Multiple community-based surveys across South Asia and sub-Saharan Africa have documented worm-infestation prevalence ranging from under 10% to over 80% among school-age children, depending on local sanitation infrastructure, water supply, and hygiene practice [8,9,4,10,11,12]. The Global Burden of Disease Study (2015) estimated that approximately 428 million people worldwide are infected with hookworm alone, contributing an estimated 4.1 million disability-adjusted life-years — possibly the largest disability burden among all neglected tropical diseases [13]. Children bear a disproportionate share of this burden because of more frequent skin exposure to larvae-contaminated soil, hand-to-mouth behaviour, and, in many communities, a higher likelihood of walking barefoot and playing in contaminated soil [2].

Multiple studies have linked helminth infestation not only to anaemia and malnutrition but also to secondary behavioural and developmental consequences in children, including diminished attention and physical fitness [14], association with pica or geophagia [16], nail-biting as both a risk factor and a maintaining behaviour for reinfection [15], disturbed sleep [19], nocturnal enuresis in the specific context of Enterobius vermicularis infection [18], and bruxism [17]. These associations underscore that intestinal helminthiasis in children is not merely a gastrointestinal problem but one with wide-ranging effects on growth, nutrition, cognition, and behaviour [21,20].

4. CONTEMPORARY MEDICAL PERSPECTIVE

4.1 Nematodes (Roundworms)

4.1.1 Ascaris lumbricoides

Ascaris lumbricoides is the most prevalent intestinal helminth of humans, with an estimated one billion people infected worldwide; it occurs wherever hygiene and sanitation standards are low or where human faeces are used as fertiliser [22]. The adult worm is a roundworm, typically 2–3 cm in length, residing in the lumen of the jejunum and mid-ileum. Infection follows oral ingestion of soil containing embryonated eggs. During the pulmonary migratory phase, larvae can produce capillary and alveolar damage manifesting as low-grade fever, non-productive cough, blood-tinged sputum, wheeze, dyspnoea, sub-sternal chest pain, urticaria, and localised rales. Heavy intestinal infection may cause peptic-ulcer-like symptoms or vague pre- or post-prandial abdominal discomfort, and adult worms may occasionally be coughed up, vomited, or passed through the nose or anus [22].

Ectopic migration of adult worms into the common bile duct, pancreatic duct, appendix, or diverticula can precipitate cholangitis, cholecystitis, pyogenic liver abscess, pancreatitis, or obstructive jaundice; very heavy worm burdens may cause frank intestinal obstruction, volvulus, or intussusception, and, in the setting of typhoid fever, worms may penetrate weakened bowel walls.

Moderate to heavy worm loads have also been associated with growth stunting in children [22]. Larval passage through the respiratory tract can additionally provoke bronchitis or, rarely, fatal pneumonia, while the presence of adult worms in the stomach and intestine can produce diarrhoea, colicky pain, malabsorption, anaemia, indigestion, or constipation [5]. The World Health Organization defines heavy Ascaris infection as an egg count of 250,000 eggs per gram of faeces [23]; the use of human faeces as fertiliser, open defaecation, and hand-to-soil-to-mouth contact remain the principal drivers of transmission [6].

4.1.2 Enterobius vermicularis (Threadworm/Pinworm)

Enterobius vermicularis, the pinworm, has a cosmopolitan distribution and spreads readily in crowded settings with frequent person-to-person contact, such as schools and childcare institutions [6]. The adult worm is small — roughly 1 cm long, white, and thread-like — and inhabits the caecum, appendix, ileum, and ascending colon. A single female may lay an average of 11,000 eggs, which are commonly found in household dust and on walls [5]. The hallmark clinical feature is perianal pruritus; scratching contaminates the fingers and facilitates both auto-reinfection and transmission to contacts. Adult worms may occasionally migrate within the colon or ascend the urethra or, in girls, the vagina.

The appendix is a frequently colonised site, which explains the not-infrequent recovery of pinworms from surgically removed appendices, although their causative role in appendiceal inflammation remains uncertain. The principal symptom complex comprises anal and vulval irritation — threadworm being a recognised cause of vulvovaginitis in girls — together with restlessness, sleeplessness related to nocturnal itching, vague abdominal pain, and a tendency toward unexplained diarrhoea; thumb-sucking and nail-biting perpetuate the cycle of reinfection [5]. Diagnosis rests on identifying the adult worm or its eggs in stool or on a perianal cellophane-tape swab; symptomatic relief of itching can be achieved with petroleum jelly or anti-pruritic preparations applied two to three times daily, alongside definitive anthelmintic treatment [5,18].

4.1.3 Ancylostomiasis (Hookworm Disease)

Hookworm infection is among the most prevalent infectious diseases of humans, affecting over one billion people worldwide. Two species are of principal clinical importance: Ancylostoma duodenale, most commonly encountered in Egypt, India, Queensland, and the southern United States, and Necator americanus, found across the Americas, the Philippines, and India [2]. Children show a higher prevalence of infection than adults because of more frequent skin exposure to soil-borne larvae, and prevalence rates of 80–100% are reported in tropical, less-developed regions where warm, moist soil, absent public sewage systems, and barefoot habits favour transmission.

Filariform larvae penetrate intact skin, migrate via the bloodstream to the lungs, break into the alveolar spaces, ascend the trachea, and are subsequently swallowed; the adult worms mature and attach to the mucosa of the upper small intestine, where they ingest blood and cause additional focal mucosal bleeding [6]. The average daily blood loss attributable to a single A. duodenale worm is approximately 0.15 mL, and to a single N. americanus worm approximately 0.03 mL [24]; the cumulative effect of a substantial worm burden is a characteristically microcytic, hypochromic anaemia, particularly severe in children on a protein-deficient diet. Clinical features include abdominal pain, anorexia, indigestion, postprandial fullness, and diarrhoea; chronic infestation may progress to anaemia, hypoalbuminaemia, and dependent oedema, with dyspepsia, epigastric pain, and pica — a craving for soil, mud, or lime — also described [3,25].

4.1.4 Trichuriasis (Whipworm)

Trichuris trichiura is prevalent across most tropical regions, including all parts of India, and is closely related to a species that infects pigs; whipworm infestation tends to be most severe among children living in overcrowded conditions with close pig contact [2]. The adult worm, roughly 5 cm long, is widely distributed in warm, moist climates. Its anteriorly tapering, whip-like segment burrows into the superficial mucosa of the caecum, lower ileum, or ascending colon, while eggs passed in the stool are readily identified on microscopy. Light infection typically causes right-sided abdominal pain, whereas heavy infestation can produce severe, often bloody diarrhoea, occasionally with rectal prolapse.

4.2 Cestodes (Tapeworms)

Cestodes, or tapeworms, are segmented flatworms in which the adult form typically resides in the human gastrointestinal tract, although the larval form can occur in almost any organ. Human tapeworm infections fall into two broad categories: infections in

which humans serve as the definitive host and harbour the adult worm in the gut (as with Taenia saginata, Diphyllobothrium species, Hymenolepis, and Dipylidium caninum), and infections in which humans act as intermediate hosts harbouring the larval (cystic) stage in tissue. For Taenia solium uniquely, humans may occupy either role.

4.2.1 Taenia saginata (Beef Tapeworm)

T. saginata is distributed worldwide wherever raw or undercooked beef is consumed, with the highest prevalence in sub-Saharan Africa and the Middle East. Humans are the sole definitive host for the adult stage; the worm, which may reach up to 8 metres in length, possesses a scolex with four prominent suckers and can carry 1,000–2,000 proglottids, inhabiting the upper jejunum. Most patients first become aware of the infection on noticing passage of motile proglottids in the stool [25].

4.2.2 Taenia solium (Pork Tapeworm)

T. solium is endemic in central Europe, southern Africa, South America, and parts of Asia. The adult worm, typically about 3 metres long, resides in the upper jejunum, attaching by a globular scolex bearing both sucking disks and two rows of hooklets; it may carry up to 1,000 proglottids, each capable of producing as many as 50,000 eggs. When eggs are ingested by an intermediate host, they embryonate, penetrate the intestinal wall, and disseminate to tissues — with a predilection for striated muscle of the neck, tongue, and trunk — where the encysted larval (cysticercus) stage develops within 60–90 days. Intestinal infection with the adult worm may be entirely asymptomatic, though epigastric discomfort, nausea, hunger sensation, weight loss, and diarrhoea are occasionally reported, and patients may notice fecal passage of proglottids [25].

4.3 Additional Clinical Features Associated with Helminthic Infection

- Cutaneous larval penetration may cause transient, linear, pruritic erythema (“ground itch”).
- Respiratory migration of larvae can produce pneumonitis or a Loeffler-type eosinophilic syndrome.
- Intestinal mucosal invasion can cause ulcerative or haemorrhagic enteritis, with resultant hypoproteinaemia and anaemia in heavy infections.
- Acute disseminated strongyloidiasis may occur during pregnancy, the puerperium, or in immunosuppressed individuals and can be fatal if unrecognised [26].

5. THE UNANI PERSPECTIVE ON INTESTINAL WORMS (DEEDAN-E-AMAA)

5.1 Classical Aetiological Concepts

Unani medicine offers an independent, internally consistent account of intestinal worm formation rooted in humoral pathology. Ali ibn al-Abbas al-Majusi held that the small and large worms found in the intestine arise from putrefied phlegm (balgham) within the bowel; this putrefaction generates an abnormal internal heat (hararat-e-ghareeba) that gives rise to the worms. He described worms occurring predominantly in the small intestine, along with a second, broader and flatter variety resembling a gourd seed — hence termed Kaddu Dana — found chiefly in the caecum, and a third, smaller variety confined to the rectum [29].

Zakariya al-Razi classified intestinal worms among the abnormal (khilaf-e-tabi'i) entities of the body that, once formed, must be eliminated by killing the parasite; he located them predominantly in the intestine and attributed their genesis to putrefied phlegm, particularly in individuals whose diet consists largely of moist, mucilaginous foods (tar wa laisdaar ghiza). He further observed a seasonal predominance during the kharif (monsoon) season, attributable to the abundance of seasonal fruit consumed at that time, while acknowledging that worm infestation could occur in other seasons as a consequence of contaminated or unhygienic food intake [28].

Ibn Sina (Shaikh-ur-Rais), in Al-Qanoon fit Tibb, similarly attributed worm formation to excessive production of phlegm, favoured by an oily, raw diet and facilitated by the consumption of liquids and beverages [27]. Hakeem Ghulam Jeelani identified indigestion arising from contaminated water and food harbouring ova or cysts as a proximate cause [30], while Hakeem Ajmal Khan listed excessive intake of chilled or cold water, cold fruit, drinking water to excess during meals, and dyspepsia or indigestion as contributory factors, all of which promote phlegm accumulation in the intestine and thereby favour worm formation.

Abul Mansur al-Hasan al-Aamri similarly traced the cause to intestinal accumulation of phlegm secondary to indigestion or intake of a cold (thandi), heavy (ghaleez) diet that subsequently putrefies; he further noted that individuals in whom safra (yellow bile) or sauda (black bile) predominate are relatively protected from worm formation, their inherent dryness being unfavourable to the parasites. Kabeeruddin's Al-Akseer similarly attributes worm formation to phlegmatic material generated under the influence of hararat-e-ghareeba [31,32,33] the resulting parasites are described as consuming nutrients essential to the body, producing generalised weakness, sallow or yellowish discolouration of the skin, and, secondarily, colitis — the abnormal activity and qualitative state (kaifiyat) of the worms being held to act contrary to, and hence harmful for, the body's natural constitution. Hakeem Shafaqat Azmi records that while seven types of intestinal worm are traditionally described, only three are of practical relevance in human disease, and it is this three-fold classification that forms the basis of the clinical taxonomy used in Unani practice today.

5.2 Unani Classification of Deedan-e-Amaa

5.2.1 Dawa-ul-Khul (Threadworm/Pinworm; synonyms: churna, chunula, kirm-e-saghaar, khaitiya)

This worm is likened in appearance to the minute organisms seen in vinegar, from which its name derives. It is white, 4–8 cm in length, and thread-like in breadth. Its eggs are found in household dust, on walls, and in cultivated land, and infestation often affects several members of the same household simultaneously. In children it is typically found in the rectum and occasionally at the anal or vaginal orifice; both ends of the worm are conical.

5.2.2 Hayat (Khaichvae) — Roundworm

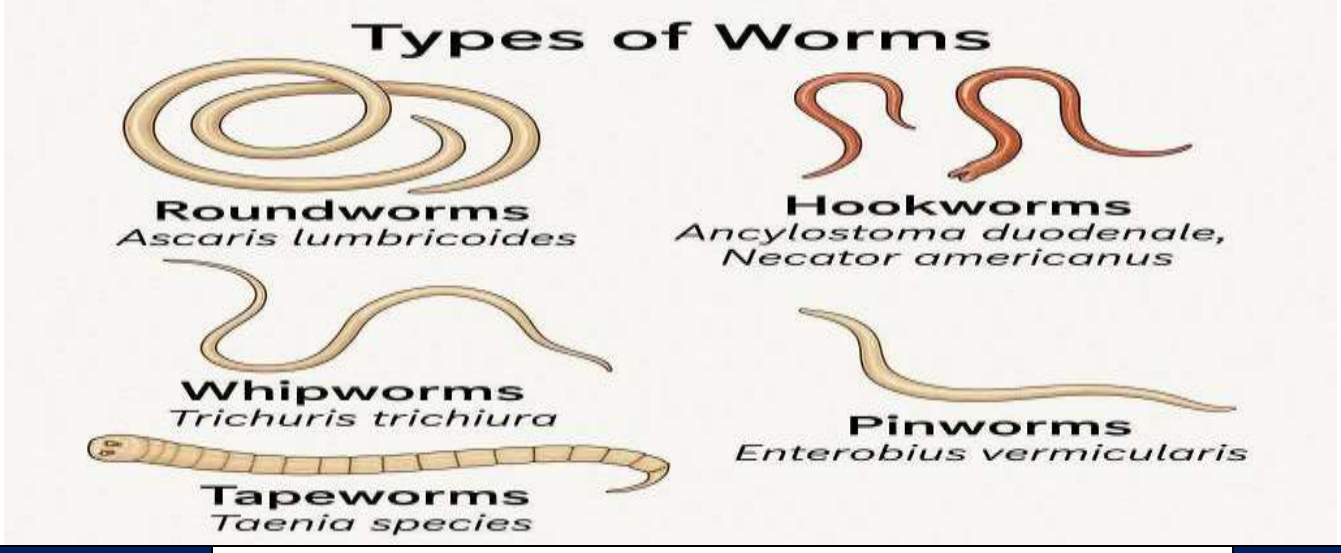
Reported to affect up to 80% of children in India historically, Hayat is described as a leading cause of childhood mortality in classical Unani sources. The worm measures 15–25 cm, bears small teeth around the mouth surrounded by three raised areas, and resembles an earthworm in colour. It is typically found in the stomach, oesophagus, larynx, or nasal passages, and occasionally in the rectum or urethra, or, in girls, the vagina. Usually two or three worms are present, though colonies may occasionally occur.

5.2.3 Habb-ul-Khura (synonyms: Deedan-e-Amaa, Shuratiya, Kaddu Dana) — Tapeworm

This category, associated with the consumption of raw or undercooked pork or beef, is further subdivided into three varieties:

- Kharye Khinzeer (Kharye Salaahiya): 1–2 metres in length, acquired through pork consumption, with small protrusions on the head.
- Mutawassita Kharye Baqariya: 4–7 metres in length, associated with beef tapeworm, the head lacking protrusions.
- Kharye Aarizaa (Kharye Azeemah): the longest and broadest variety, whose embryos may migrate to any body site — including, in some cases, the brain, where they have been associated with epileptic seizures.

Hakeem Ghulam Imam additionally attributed worm formation to consumption of unhygienic food and inadequate perianal cleansing after defaecation [34]



5.3 Clinical Features According to Unani Classics

Classical Unani texts describe a broad symptom complex common to intestinal worm infestation, including abdominal pain, nausea, and teeth grinding [25], together with indigestion and anorexia. A burning sensation (lazaa) is described at the gastric orifice, with an upward crawling sensation on an empty stomach; worms may occasionally be visible in vomitus or stool, and stool volume is often reduced [35,36]. Affected children frequently develop food aversion and diminished appetite, though increased appetite is occasionally noted, along with heightened craving for sweets and polydipsia. Persistent fatigue and heaviness of the eyelids, disturbed sleep-wake rhythm, and abdominal distension resembling ascites are also described, alongside alternating diarrhoea and constipation. Diagnosis by classical authorities rested on visualisation of adult worms in stool or on microscopic stool examination [32].

Symptoms specifically attributed to Habb-ul-Khura

Abdominal pain and distension, spasmodic rectal pain, and dirty, muddy-coloured stools are described as characteristic; increased appetite together with visible passage of worm segments in stool is considered a distinguishing feature, alongside abdominal cramping, intestinal pain, and restlessness [36,37].

Symptoms specifically attributed to Khaichvae (roundworm)

This form is most common in children and is characterised by nocturnal itching, a tendency to pick or rub the nose and lips, and facial or eyelid oedema. Rectal prolapse may occur secondary to straining at defaecation. In girls, vulvar itching is described [38].

Symptoms specifically attributed to Dawa-ul-Khul (threadworm)

Itching in the anal canal and, in girls, the vagina is characteristic and may lead to irritability, insomnia, abdominal pain, and diarrhoea; vulvovaginitis is regarded as a special hallmark of this variety. Reinfection is attributed to thumb-sucking and nail-biting [32].

Across all three varieties, classical texts additionally describe dryness of the lips during the day with wetness and drooling of saliva at night [35], progressive weakness and anaemia secondary to nutritional deprivation [38], irritability with perianal irritation [39], intermittent excretion of worms in stool with occasional lodgement deep in the rectum [40], and yellowish facial discolouration [3]. Neurological features associated with roundworm infestation in the classical literature include irritability, febrile or nocturnal convulsions in infancy, fear during sleep, urinary frequency, anuria, phimosis, or vaginal discharge [38], together with halitosis, irregular bowel habit, headache, vertigo, epilepsy, tremor, and, in some descriptions, bulimia and marked palpitation.

6. DIAGNOSIS

Diagnosis of intestinal helminthiasis in contemporary practice relies principally on microscopic stool examination for ova, larvae, or adult worms, supplemented, where indicated, by the cellophane-tape (Scotch-tape) perianal swab for Enterobius vermicularis, full blood count (to detect eosinophilia or microcytic anaemia in hookworm infection), and, in selected cases, imaging or endoscopy for ectopic or obstructive complications. Classical Unani diagnosis, similarly, is based principally on direct visualisation of adult worms or segments in stool or vomitus, correlated with the characteristic symptom pattern described for each of the three traditional categories of Deedan-e-Amaa [32].

7. PREVENTION AND PUBLIC HEALTH STRATEGY

In 2001, the World Health Assembly urged member states to implement periodic deworming programmes to control morbidity from hookworm and other soil-transmitted infections [13]. Prevention of ascariasis is closely tied to improvement in socio-economic conditions and increased health education [25]. Practical measures for reducing reinfection in children include keeping the hands clean with nails trimmed short, maintaining perianal hygiene, and wearing pyjama trousers at night to discourage scratching [40]; proper disposal of faeces and routine use of footwear are central to hookworm prevention, and associated anaemia

should be corrected with iron therapy or, where severe, blood transfusion. Prevention of taeniasis additionally requires thorough cooking of meat, careful washing of raw fruit and vegetables, treatment of intestinal carriers, avoidance of human excrement as fertiliser, and provision of adequate sanitary facilities [41].

The World Health Organization's strategy for STH control emphasises morbidity control through periodic treatment of at-risk populations in endemic areas, with school-based deworming programmes offering a particularly effective delivery platform, since schools provide an accessible entry point for combining anthelmintic administration with hygiene education such as promotion of handwashing and improved sanitation. National control programmes commonly target school-age children specifically because they harbour the heaviest worm burdens and are the principal source of environmental egg contamination, while the school system offers an efficient setting for both deworming and health-education delivery. A Cochrane systematic review of deworming interventions (last updated 2012) concluded that a single anthelmintic dose measurably increases weight and haemoglobin concentration in children with confirmed worm infection [20].

8. MANAGEMENT

8.1 Conventional Pharmacological Treatment

The benzimidazole anthelmintics mebendazole (500 mg) and albendazole (400 mg) remain the mainstay of conventional treatment for most soil-transmitted helminth infections, being effective, well tolerated, and administrable as single-dose regimens in community-based deworming programmes [23].

8.2 Unani Line of Treatment (Usool-e-Ilaj)

Classical Unani therapeutics for Deedan-e-Amaa recognise that, because the worm may be firmly attached to various sites within the gut, its complete elimination can be technically difficult. The customary approach begins with vermicidal (Qatil-e-Deedan) agents intended to kill the parasite in situ, followed by worm-expelling (Muhrij-e-Deedan) agents to facilitate its evacuation from the bowel; drugs used for this purpose are typically bitter, drying, and heating (haar wa yaabis) in temperament [27,30,33].

Because most vermicidal and worm-expelling preparations are unpalatable and malodorous, they are traditionally administered with the nose held closed to mask taste and smell; these agents are also considered to aid digestion and appetite. When worm infestation coexists with diarrhoea, mildly constipating (qabiz) drugs may be added to the regimen, while in patients with strong innate resistance (quwwat-e-mudafi'a), oral liquid preparations may be used alone. Tapeworm infestation (Habb-ul-Qara) is traditionally regarded as more difficult to treat than roundworm (Tiwal) infestation.

8.3 Single Drugs Used as Anthelmintics (Qatil-e-Deedan-e-Shikam)

A range of single herbal and mineral drugs is described in classical Unani pharmacopoeia for anthelmintic use [42] including:

- Post Neem (Melia azadirachta, bark)
- Beikh Bakain (Melia azedarach, root/bark)
- Arusa (Adhatoda vasica, leaf)
- Kamela (Mallotus philippinensis)
- Ushba Maghrabi (Sarsaparilla europaea, herb)
- Maghz Narjil Kohna (old Cocos nucifera fruit)
- Nankhwah (Carum copticum, seed)
- Baobarang (Embelia ribes, seed)
- Post Beikh Anar (Punica granatum, root bark)
- Khurfa (Portulaca oleracea)
- Darmana (Artemisia maritima)
- Fofal (Areca catechu, nut)

- Heeng (Ferula foetida, latex/gum resin)
- Chirata (Swertia chirata, herb)
- Kalonji (Nigella sativa, seed)
- Sana (Cassia senna, leaf)
- Gilo (Tinospora cordifolia, herb)
- Bozidan (Anacyclus pyrethrum, root)
- Barg-e-Bedanjeer (Ricinus communis, leaf)
- Mur (Commiphora myrrha, gum)
- Ispand (Peganum harmala, seed)
- Babchi (Psoralea corylifolia, seed)
- Rewand (Rheum palmatum, root)
- Saqmoonia (Convolvulus scammonia, root latex)
- Rasaut (Berberis aristata, extract)
- Palas Papra (Butea monosperma, seed)
- Beikh Jalapa (Ipomoea jalapa, root)

Enema oils used to expel worms from the stomach and intestine include Roghan Turpin (turpentine oil), Roghan Bedanjeer (castor oil), Roghan Zaitoon (olive oil), and Sirka (acetic acid/vinegar).

8.4 Compound Formulations (Murakkabat)[42]

- Qurs Deedan
- Majoon Sarakhs
- Itrifal Deedan

Clinical evaluation of compound Unani anthelmintic formulations remains limited but growing; for example, a controlled evaluation of the formulation Qurs Deedan Jadeed demonstrated measurable anthelmintic activity in a laboratory and clinical setting [42], illustrating the potential for systematic pharmacological validation of the wider Unani anthelmintic pharmacopoeia.

9. DISCUSSION: TOWARD AN INTEGRATIVE PERSPECTIVE

A comparison of the two traditions reveals a striking degree of clinical convergence despite their entirely independent theoretical foundations. The Unani three-fold classification of Deedan-e-Amaa maps closely onto contemporary parasitological categories: Dawa-ul-Khul corresponds closely to Enterobius vermicularis (pinworm), Hayat to Ascaris lumbricoides (roundworm), and Habb-ul-Khura to the cestodes (Taenia species). Classical descriptions of perianal itching, nocturnal restlessness, vulvovaginitis, nasal picking, growth impairment, anaemia, and abdominal distension correspond closely to the clinical features documented in the modern paediatric and parasitological literature reviewed above, suggesting that centuries of careful clinical observation captured a genuinely consistent disease pattern, independent of the differing aetiological frameworks used to explain it.

From a public-health standpoint, the two systems are also complementary in their preventive emphasis: both traditions independently identify unhygienic food and water, contaminated soil contact, and inadequate personal hygiene as central to transmission, and both advocate dietary and behavioural modification alongside pharmacological treatment. While conventional benzimidazole anthelmintics offer well-established efficacy and are the backbone of large-scale deworming programmes, the extensive Unani pharmacopoeia of single and compound anthelmintic drugs represents an under-explored resource that, subjected to rigorous pharmacological and clinical evaluation, could usefully supplement existing control strategies — particularly in regions where such traditional medicine already enjoys community acceptance and where its constituent plant drugs are locally available and inexpensive.

10. CONCLUSION

Intestinal helminthiasis remains a preventable but persistent cause of morbidity among children in endemic regions, with well-documented consequences for growth, nutrition, and cognitive development. Contemporary medicine provides validated diagnostic tools and highly effective single-dose anthelmintic therapy suitable for mass deworming programmes, while classical Unani medicine independently offers a coherent clinical taxonomy and a broad range of traditional anthelmintic remedies that have, for the most part, not yet been subjected to modern pharmacological scrutiny. Bringing these two bodies of knowledge into dialogue — through comparative clinical description, as attempted in this review, and through future pharmacological and clinical validation of Unani anthelmintic formulations — offers a promising direction for a more comprehensive, community-appropriate strategy against intestinal helminthiasis in children

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