

REVIEW ARTICLE

Beeja Dushti to Ojas Kshaya: Ayurvedic Interpretation and Supportive Care in Childhood Type 1 Diabetes

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ABSTRACT

Background: Type 1 diabetes mellitus (T1DM) is an autoimmune condition characterized by the destruction of pancreatic beta cells, resulting in absolute insulin deficiency. Managing pediatric T1DM poses significant challenges due to the need for lifelong insulin therapy, regular monitoring, dietary adherence, and psychological stress on both children and their caregivers. In Ayurvedic literature, this condition closely resembles *Sahaja Prameha*, a congenital or hereditary form of *Madhumeha*. Ayurveda identifies *Beeja Dushti* (genetic defect), *Ojas Kshaya* (loss of vitality), and *Kapha-Pitta* imbalance as core pathological factors.

Objective: The objective of the study was to explore and establish the role of Ayurvedic therapies as a supportive, adjuvant approach in the holistic management of pediatric T1DM (*Sahaja Prameha*), with an emphasis on prevention, metabolic correction, and enhancement of quality of life.

Materials and Methods: This study is a conceptual and evidence-informed review based on classical Ayurvedic texts and modern biomedical literature.

Results: Ayurvedic protocols including *Shamana* (palliative therapy), *Shodhana* (purification therapy), *Rasayana* (rejuvenating therapy), and *Pathya-Apathya* (wholesome-unwholesome dietary and lifestyle measures) demonstrate potential to support glycemic control, modulate immunity, and delay complications in children with T1DM. Millet-based diets show promising adjuvant roles. Yoga practices help reduce glycemic variability and promote mental and physical well-being.

Conclusion: While insulin therapy remains indispensable, Ayurveda offers a complementary and individualized approach that addresses the broader physical, metabolic, and emotional dimensions of pediatric T1DM. When integrated responsibly, Ayurvedic therapies may enhance treatment outcomes and quality of life in children suffering from *Sahaja Prameha*. Further clinical research is warranted to substantiate these findings and optimize integrative care models.

1. INTRODUCTION

Type 1 diabetes mellitus (T1DM) is a heterogenous disorder characterized by autoimmune mediated destruction of pancreatic beta cell culminating in absolute insulin deficiency.^[1] T1DM is also on prevalent similar to Type 2 diabetes, even though not in the same

proportion, but with a trend of 3–5% increase/year. India has three new cases of T1DM/100,000 children of 0–14 years. Three sets of prevalence data show 17.93 cases/100,000 children in Karnataka, 3.2 cases/100,000 children in Chennai, and 10.2 cases/100,000 children in Karnal (Haryana).^[2] T1DM is a challenging condition for both children and their families. This condition is complex to manage, requiring term effort where the key player is the patient.^[3] Frequent blood sugar checks and daily insulin injections can be physically uncomfortable and emotionally draining. The high cost of insulin and monitoring tools adds financial pressure. Diet plays a key role

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in diabetes management, but maintaining a healthy and consistent eating pattern is tough in children due to their food preferences, erratic schedules, and social environments. Striking a balance between nutrition and glycemic control remains a daily challenge. Therefore, efforts should be made to explore the role of Ayurveda in this field. Ayurveda describes Prameha as a group of metabolic disorders, with Madhumeha being most similar to T1DM. In children, this condition is referred to as Sahaja Prameha (congenital diabetes), indicating its congenital or hereditary nature. Classical texts acknowledge the genetic basis of such disorders, stating that defects in Beeja (sperm/ovum), Beeja Bhaga (chromosomes), and Beeja Bhaga Avayava (genes) can lead to congenital diseases, including Prameha. Sushruta further notes that children born to parents with Prameha are more likely to inherit the condition.^[4] Ayurveda views T1DM as resulting from Ojas Kshaya (loss of vitality), Meda Dhatu Dushti (vitiation of adipose tissue), and Kapha-Pitta imbalance. Management focuses on Shodhana (purification), Shamana (*Dosha* balancing medications) formulations like Nisha-Amalaki,^[5] Mahadadimadi Ghrita,^[6] Phalatrikadi Kwath,^[7] Rasayana (rejuvenating therapy) to restore Ojas (vitality), and strict dietary and lifestyle practices. While not a replacement for insulin, Ayurveda provides a supportive, holistic approach that enhances glycemic control and quality of life in pediatric T1DM and measures are taken to establish the same in this article.

2. MATERIALS AND METHODS

This study was designed as a conceptual, observational, and review-based article with clinical insights on the role of Ayurvedic adjuvant therapy in pediatric T1DM, corresponding to *Sahaja Prameha* in Ayurvedic literature. The approach is both theoretical (classical Ayurvedic texts) and evidence-informed, combining Ayurvedic principles with modern clinical perspectives. Classical Ayurvedic texts such as the Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, and Madhava Nidana were thoroughly reviewed to explore foundational references related to *Prameha*, with a special focus on *Sahaja Prameha*, *Ojas Kshaya*, and their associated management protocols, including *Shamana* (palliative therapy), *Shodhana* (purificatory procedures), *Rasayana* (rejuvenation therapy), and *Pathya-Apathya* (wholesome-unwholesome dietary and lifestyle measures). Alongside these primary sources, contemporary Ayurvedic commentaries and peer-reviewed research journals such as AYU, Ancient Science of Life, and the Journal of Ayurveda and Integrative Medicine were examined to understand the evolution of clinical interpretations and their applicability in modern contexts. In addition, modern biomedical literature was accessed through databases such as PubMed, Scopus, and Google Scholar to gather updated epidemiological data on T1DM in children, the unique challenges in pediatric diabetes care, and current evidence supporting Ayurvedic interventions – including herbal formulations, the use of millets in diet, and yoga practices – as complementary or adjuvant strategies for improving glycemic control and quality of life in children with T1DM.

3. DISCUSSION

3.1. Conceptual Understanding in Ayurveda

Ayurveda classics have explained thoroughly the disease *Prameha* and its management but specific description of *Prameha* in children is lacking. *Prameha* in Ayurveda is a gross disease entity. Many genitourinary conditions are described under this heading. One entity is *Madhumeha*, has a close resemblance with Diabetes mellitus. The classics have given a detailed account of disease, but its occurrence, signs and symptoms, complication and management specific to children

is an untouched area by all classical text and there is no direct reference in any of these contexts. In Ayurvedic classics, *Sahaja Prameha* is considered difficult to cure due to its hereditary origin.^[8] Diseases inherited from parents, especially when one or both are affected by *Prameha*, are believed to arise from defects in the genetic components of the reproductive elements - Shukra (sperm) and Shonita (ovum). According to ancient wisdom, not all offspring mirror their parents' traits entirely; only those aspects that are compromised in the Beeja (germ cells) or Beeja Bhaga (genetic sub-parts) manifest as disorders. Hence, if the genetic imprint related to *Prameha* is impaired in the seed, the child may be born with this condition.^[9]

3.1.1. Samprapthi-Ghatakas

- *Dosha: Kapha and Pitta* (primarily), *Vata* (secondary due to *Ojas Kshaya*)
- *Dushya: Meda, Rakta, Rasa, Ojas*
- *Srotas: Mutravaha Srotas*
- *Agni: Dhatvagni Mandya*, particularly *Meda Dhatvagni*
- *Udbhava Sthana: Beeja dushti* (genetic level)
- *Sanchara Sthana: Rasa, Rakta, Meda Dhatu, Mutravaha Srotas*
- *Adhithana: Basti* (Urinary system)
- *Roga Marga: Abhyantara*
- *Sadhyasadhya: Kricchra Sadhya or Asadhya* depending on severity.

3.1.2. Samprapti

T1DM, described in Ayurveda as *Sahaja Prameha*, originates from a genetic defect or *Beeja Dushti*, leading to the faulty development of metabolic pathways from birth. This foundational imbalance sets the stage for a cascade of *Doshic* disturbances. Primarily, *Kapha Vriddhi* results in a sluggish metabolism and the accumulation of excessive *mala*, such as sugar in the urine. Simultaneously, *Pitta Prakopa* contributes to inflammation and furthers the depletion of *Ojas*, the vital essence responsible for immunity and strength. As the condition progresses, *Vata* becomes aggravated secondarily, leading to tissue depletion. The impairment of *Meda Dhatvagni* (the metabolic fire responsible for fat metabolism) causes *Dhatvagni Mandya*, resulting in the accumulation of *Meda* (fat tissue) and *Kleda* (fluid metabolic waste). This leads to classical symptoms such as *Prabhuta Mutrata* (polyuria) and *Avasthambha* (metabolic obstruction), eventually causing *Ojas Kshaya* - a significant loss of vitality and immune strength. The blockage of *Mutravaha Srotas* (urinary channels), known as *Srotorodha*, manifests in the clinical features of *Madhumeha*, including glucosuria, fatigue, and weight loss. If left unmanaged, this pathological process can culminate in *Vyadhi Sankara* (complications), such as weak immunity, recurrent infections, vision impairment, and severe emaciation.

3.2. Management

Preventive aspects include exclusive breastfeeding for 6 months, weaning at an appropriate time, avoidance of *Virudhha Ahara* (unwholesome food), introduction of cow milk medicated with *Hrasva Panchamula* if mother's milk is not available, Avoidance of complex diet during weaning period, use of *Bala Rasayana*, *Swarnaprashana*.

3.2.1. Shaman Chikitsa

Considering all factors, the drugs, diet and activities of daily living being used for the treatment for *Prameha* in children should have *Pramehahara* (Anti-diabetic), *Rasayana* (Rejuvenating, antioxidants) and *Ojovardhaka* (improves the health, vitality and enthusiasm) action for the alleviation and prevention of diseases.

3.2.2. *Sodhana Chikitsa*

According to Ayurveda, all diseases are due to *Dosha* imbalance. *Shodhana* therapy (Detoxification techniques) therefore focuses on eliminating the provoked humors present in the body. *Shodhana Karma* (purificatory therapy) helps to clean the *Srotas* (channels) and rejuvenates them thus, ensuring a proper transportation of the metabolites. *Udvardana* (Massage with medicinal powder) *Takradhara* (Head Shower with medicated buttermilk *Ksheera Dhara*), Shower with medicated milk^[10] and *Madhutailika Basti*^[11] should be included.

3.2.3. *Aahara Vihar (diet and lifestyle regimen)*

Dietary adherence is also an important factor in diabetes management to prevent further progression of complications.^[12] According to Acharya *Lolimbaraja*, he has said that, if a person is taking *Pathya*, then there is no need of medicine, and if a person is taking *Apathya*, there is no benefit of medicine.” *Pathya* refers to food and exercise that are good for the mind and *Srotasa* (channels), but not injurious to the body. The term “*Apathya*” should be used to describe behaviors and foods that are disagreeable to the body and mind. *Deepana* (enhancing appetite), *Pachana* (enhancing digestion), *Krimighana* (anti-microbial), *Srotoshodhaka* (clearing channels), *Dhatu Poshaka* (nutritious), *Varnya* (beneficial for skintone), and *Rasayana* are some examples of these *Dravya* deeds. These attributes support the upkeep of *Tridosha* and *Agni*’s *Samyavastha* as well as the formation of *Dhatu*’s virtues. Ayurvedic diet for *Prameha* incorporates *Pramehahara* and *Rasayana* foods, many of which are scientifically proven to have a low glycemic index (GI), supporting glycemic control and metabolic health. *Vihara* includes regular moderate exercise (like brisk walking, yoga, or swimming) to enhance glucose utilization and insulin sensitivity, ideally performed at consistent times and not immediately after meals. Stress-reducing practices such as *Pranayama*, meditation, and mindful routines help calm aggravated *Pitta* and maintain glycemic stability. Establishing a stable sleep–wake cycle, avoiding late nights, and adhering to *Dinacharya* (daily regimens like fixed meal times and gentle *Abhyanga* massage) nurture digestive fire and hormonal rhythm.

3.3. Role of Millets in Diabetes

Millets are among the earliest domesticated cereal crops in human agricultural history.^[13] Dietary glycemic load is directly linked to a higher risk of developing hyperglycemia. Dietary fiber is crucial for glucose regulation. Millet is an excellent source of leucine, slowly digesting carbohydrate, and minerals, blunting the otherwise sudden increase in postprandial glucose level. *In vivo*, studies have revealed the effectiveness of millets in controlling postprandial hyperglycemia.^[14] Out of 19 studies included in a systematic review, 17 reported not only a decrease in blood glucose levels but also reductions in serum cholesterol and triglycerides among individuals consuming foods with a lower GI. Millets, with GI values ranging from 40 to 70, demonstrated a lower glycemic impact compared to commonly consumed grains like wheat, refined flour, rice, and maize.^[13] Ragi, also known as finger millet, is beneficial for managing postprandial blood glucose due to its rich composition of phenolic compounds and phytates – especially in the seed coat – that inhibit carbohydrate-digesting enzymes like α -glucosidase and pancreatic amylase. These bioactive components slow the breakdown and absorption of starches, resulting in a more gradual rise in blood sugar after a meal. In addition, ragi’s intermediate GI (ranging from about 54 to 68) is lower than that of wheat, reflecting its ability to moderate post-meal glucose spikes [Table 1].^[15]

3.4. Role of Yoga in Diabetes

Yoga is a holistic practice involving *Kriya*, *Asana*, *Pranayama*, *Mantra*, *Aahar – Vihara*. It supports diabetes management by improving glycemic control, regulating eating behavior, enhancing self-awareness, and promoting adherence to healthy habits and medications, even in Type 1 diabetes. A randomized controlled study conducted by *Maurya et al.* (2025) found that implementing a structured yoga program for 3 months led to a notable improvement in glycemic control, with a 14.6% reduction in HbA1c levels, and enhanced quality of life among adolescents with Type 1 Diabetes. These findings highlight yoga’s potential as an effective supportive therapy alongside insulin treatment in T1DM care.^[16] The yoga intervention incorporated a structured module tailored for individuals with Type 1 Diabetes. Specific kriyas included *Agnisara Kriya* and *Kapalbhati*, followed by loosening and stretching postures such as *Urdhva Hastasana* and *Tadasana*. The dynamic sequence of *Suryanamaskar* was used to enhance metabolic activity. A series of asanas were practiced, including *Vakrasana*, *Mandukasana*, *Pavanamuktasana*, *Setubandhasana*, *Bhujangasana*, and *Dhanurasana*. In addition, the *pranayama* component comprised *Anuloma–Viloma* and *Bhramari Pranayama*, aiming to regulate the autonomic nervous system and support glycemic control.^[17]

4. CONCLUSION

T1DM, identified in Ayurveda as *Sahaja Prameha*, presents a complex and lifelong challenge, especially in children. While insulin therapy remains the cornerstone of modern medical management, it often falls short of addressing the holistic needs of pediatric patients, including metabolic balance, immunity, emotional resilience, and quality of life. Ayurveda offers a time-tested, supportive approach that complements conventional treatment through its focus on *Shamana* (palliative therapies), *Shodhana* (detoxification), *Rasayana* (rejuvenation), and *Pathya-Apathya* (dietary and lifestyle regulations). The Ayurvedic perspective recognizes the hereditary basis (*Beeja Dushti*) of the disease and emphasizes early preventive care, immune strengthening, metabolic correction, and vitality preservation. Integrating Ayurvedic interventions – such as herbal formulations, *Rasayana* therapies, millets, yoga, and *Swarnaprashana* – can significantly aid in better glycemic control, reduced complications, and enhanced quality of life for children living with T1DM. However, Ayurveda should be viewed as an adjuvant, not a substitute for insulin, and its integration must be done under expert guidance. A multidisciplinary, evidence-informed model that combines the strengths of both systems can offer a more comprehensive and child-centric approach to managing T1DM in today’s clinical settings.

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6. AUTHORS’ CONTRIBUTIONS

All authors give equal contribution in making of this manuscript.

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8. ETHICAL STATEMENT

Ethical approval was not required for this study as it was a review article with data obtained through a literature search.

9. CONFLICTS OF INTERESTS

The authors declare no conflicts of interest regarding the publication of this paper.

10. DATA AVAILABILITY STATEMENT

The data analyzed in this review were obtained from publicly available sources, including peer-reviewed articles, observational studies, and surveys accessible through databases.

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Table 1: Various millets to be used in diabetes mellitus

S. No.	Name of millets	Vernacular name (Hindi)	Botanical name	Reported health benefits
1.	Sorghum	<i>Jowar</i>	<i>Sorghum bicolor</i> L. Moench	Rich in anti-oxidant, reduces obesity
2.	Pearl millet	<i>Bajra</i>	<i>Pennisetum glaucum</i> L. R. Br.	Anti-oxidant,
3.	Finger millet	<i>Mandua, Ragi</i>	<i>Eleusine coracana</i> L. Gaertn	Hypo-glycemic
4.	Little millet	<i>Kutki</i>	<i>Panicum sumatrense</i>	Hypo-glycemic
5.	Kodo millet	<i>Kodon</i>	<i>Paspalum scrobiculatum</i> L.	Anti-oxidant, energy metabolism
6.	Foxtail millet	<i>Kangani</i>	<i>Setaria italica</i> L.P. Beauvois	Anti-hyperglycemic
7.	Barnyard millet	<i>Sanwa</i>	<i>Echinochloa crusgalli</i> L. P. Beauvois	Anti-hyperglycemic
8.	Porso millet	<i>Barrle</i>	<i>Pennisetum glaucum</i> L. R.Br.	Rich in essential vitamin, amino acid