



Antidiabetic Activities of Yava (Barley) Based Diet through the Literature Survey of Ayurvedic Texts

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

In the present era, people are turning towards modernization and comfort. They adopt faulty dietary habits along with a sedentary lifestyles impair individual health, and manifest plenty of lifestyle disorders. Diabetes Mellitus is one among them. Diabetes Mellitus has significant effects on an individual's quality of life as well as life expectancy. Diabetes Mellitus becomes a critical etiological factor for other life-threatening clinical entities. The treatment for this entity through modern medical sciences involves multi-drug regimens; they might be associated with various side effects. Here *Nidāna parivarjana* and lifestyle modifications can play a crucial role in the management of

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Diabetes Mellitus type 2. *Tṛṇadhānya* (millets) involved in the routine diet as a staple diet has a tremendous effect on these kinds of Lifestyle disorders. There are scattered descriptions regarding *Tṛṇadhānya* has found in *Bṛhat trayī*, and the individual chapter is found in different *Nighaṅtu* along with their *Guṇa* (properties) and *Karma* (functions). Most of the *Tṛṇa dhānyas* have *Rukśa* (dry), *Laghu* (light) *guṇa* (properties), *Kaṭu vipāka* and *Uṣṇa virya* (hot potency) which will help in mitigating the *Medodhātu* (fat) and *Kapha doṣa*. The excesses of these in the body might result in the manifestation of lifestyle disorders, including Diabetes mellitus type 2, Obesity, Coronary artery disease, Hypertension, Infertility etc. *Āyurveda* can manage the Diabetes Mellitus type 2 in a better way through modification in *Āhāra* (Diet) –*Vihāra* (Lifestyle) and *Nidānaparivarjana* (omit the causative factors). The utilities of the *Tṛṇa dhānya* as a preventive and curative aspect in lifestyle disorders with special reference to to Diabetes Mellitus type 2, are trying to explore in this article. We have attempted to uncover some facts regarding *Tṛṇa dhānya* written in *Samhitā* and *Samgraha granth*, which have never been noticed yet.

Keywords: Lifestyle disorders; *tṛṇadhānya*; *yava*; diabetes mellitus; obesity.

1. INTRODUCTION

With over about 41 million diabetics, India has become diabetes-capital of the world [1]. Between 2000 and 2019, there was a 3% increase in diabetes mortality rates by age [2]. The rising burden of Diabetes mellitus type 2 is a major concern in healthcare worldwide [3]. Diabetes Mellitus type 2 is one of the most crucial metabolic disorders characterized by Hyperglycemia and impaired Insulin secretion [4]. Its progression is followed by Diabetic keto acidosis (DKA), and also associated with a number of complications like Retinopathy, Nephropathy, Neuropathy, Peripheral vascular insufficiencies that can result in limb amputation and most critical complication is Diabetic coma [5]. Type 2 diabetes is often preventable. Factors that contribute to developing type 2 diabetes include being overweight, not getting enough exercise, and genetics [6]. Dietary management in Diabetes Mellitus type 2 has always been amongst the key strategies. Around 2800 years ago, the ancient physician, *Caraka* had identified barley as a low glycemic-dietary substitute for diabetes patients. He also advocated the different invigorating agents like honey, triphala and vinegar for use with barley-based diet and drink [7]. *Ācārya Suśruta* emphasized the importance of *Nidāna parivarjana* and *Vyāyāma* (exercises) in patients of *Prameha* and *Sthaulya*,

as well as for maintaining the homeostasis in *Doṣa* (bodily humors) for healthy living [8]. *Tṛṇadhānya* are described in *Bṛhat trayī* under the *Dhānyavarga* and as individual chapter is found in different *Nighaṅtu*. Wheat and Rice are recognized as Staple diet in India. Both increase *Kapha doṣa* and *Medo dhātu* which lead to Diabetes Mellitus type 2, Obesity etc, like lifestyle disorders. Wheat is high in sodium which might be cause Hypertension. Here these both are altered with *Tṛṇa dhānya* with special reference to *Yava*, which will help to prevent and manage lifestyle disorders, especially Diabetes Mellitus type 2 and Obesity.

1.1 Aim and Objective

1. To conceptualize the knowledge regarding *Tṛṇadhānya* (Millets).
2. To understand the utilities of *Yava* and (Millets) in Diabetes Mellitus type 2.

2. MATERIALS AND METHODS

This study is based on the literature review. Material has been collected from Ayurvedic texts e.g. *Caraka samhitā*, *Suśruta samhitā*, *Aṣṭāṅga hṛdaya*, *Bhāvaprakāśa nighaṅtu*, *Dravyaguṇa Vijiñāna*, *Rāj nighaṅtu*, *Kaideva nighaṅtu* with different commentaries, Research articles, Modern texts and National research databases.

3. RESULTS

3.1 Yava

Sarṁśodhanaṃ nārhati yah pramehī tasya kriyā sarṁśamanī prayojyaa | (Ca.Ci. 6/18)

Saṣaṣṭikam syāt tṛṇadhānyam annam yavapradhānastu bhavet pramehī | (Ca.Ci. 6/21)

-Yavah **kaṣāya** madhura suśītalāh **pramehajita tikta** kaphāpahārahah |- (Raj nighaṅṭu – Śālyādivarga)

Yavah **kaṣāyo** madhuro himaśca **kaṭu vipāke** kaphapittahārī||
vraṇeṣu pathyastilavat ca nityam **prabaddhamūtro** bahuvātavarcāh |
sthairya agni medhā balavarṇakṛcca sapicchilah **sthūlavilekhanaśca** ||
mehāpaha tṛṣṣamano atirukṣah prasādanah **Ṣoṇitapittayośca** |- (Śoḍhala nighaṅṭu)

Table 1. Rasa Pañcaka of Yava [9]

Rasa	Kaṣāya- Tikta- Madhura
Vipāka	Kaṭu
Vīrya	Śīta
Guṇa	Laghu, Rukṣa
Prabhāva	Pramehajita

4. DISCUSSION

As per *Ayurveda*, Yava has a tremendous effect found in *Prameha* and its *Upadrava*. Yava's properties and its functions are as follow:

Table 2. Yava's properties and its functions

Yava's Guṇa- karma	Utility in Diabetes Mellitus
Yavapradhānastu bhavet pramehī	As per <i>Ācārya Caraka</i> , Yava use as a staple diet is best advisable in Diabetes Mellitus type 2
Pramehajita	Cure Diabetes Mellitus
Tikta, Kaṣāya rasa & Kaṭu vipāka	These <i>guṇas</i> help to reduce excess <i>Kapha doṣa</i> and <i>Medo dhātu</i> which are culprit for Diabetes mellitus type 2
Kaphāpahārahā	These <i>karma</i> help to reduce excess <i>Kapha doṣa</i> which are important humor for Diabetes mellitus type 2
Prabaddhamūtro	Help in control excessive urination (Polyuria) which is chief clinical feature seen in Diabetes mellitus
Tṛṣṣamano	Help in mitigate excessive thirst (Polydipsia) which is also inculcated as chief symptoms of Diabetes mellitus
Hima, suśītalā	This <i>guṇa</i> is help to reduce <i>hastapādāladāha</i> (burning sensation in palm and sole) which is frequently seen in Diabetes mellitus type 2 as a complications
Vraṇeṣu pathya	Beneficial in <i>Madhumehajanīta duṣṭa vraṇa</i> (Diabetic non healing ulcers)
Balavarṇakṛcca	Enhance Strength and Complexion which are usually impaired in Diabetes mellitus type 2 due to impaired utilization of Blood glucose
Sthairya	Help in reduce <i>Dhātu śhaithilya</i> and <i>Abaddha meda</i> which is beneficial in Diabetes mellitus type 2 as well as in Obesity
Sthūlavilekhana	Reduce Obesity and it is already proved that Obesity is a prime etiological factor for Diabetes mellitus type 2
Mehāpaha	Reduce lipids and fat which will cause Obesity

Yava's Guṇa- karma	Utility in Diabetes Mellitus
<i>Atirukṣa</i>	and increases <i>Abaddha meda</i> in Diabetes mellitus Dried up <i>Abaddha meda</i> , <i>Kapha</i> which help to prevent as well manage the Diabetes and Obesity

Ācārya Suśruta mentioned that there are 2 types of *Pramehī*- 1. *Sahaja* and 2. *Apathyanimmitaja*. *Apathyanimmitaja Pramehī* is also recognized as *Sthūla Pramehī* its simply mean that unhealthy food habit in terms of excess carbohydrate and sugary food items increases *Kapha doṣa* and *Meda dhātu* result in manifestation of Diabetes Mellitus and Obesity. In all over India, Wheat (*Triticum sativum*) and Rice (*Oryza Sativa*) are used in routine diet as staple food. These both are used in the forms of Chapati, Parathas, Pudla, Dal-rice, Idli, Dhosa, Vada etc.

Yava (barley) is a functional food and one of the ancient cultivated cereal grains in the world [10]. *Yava* (*Hordeum vulgare*) is the world's fourth most important cereal crop after Wheat, Rice and maize [11]. It is readily available at a reasonable cost. It has the highest amount of dietary fibre with less gluten among all cereals, which is beneficial in Diabetes mellitus, Obesity, Dyslipidemia like, lifestyle disorders etc [12]. Wheat (*Triticum sativum*) [13] and Rice (*Oryza Sativa*) [14] have high Glycemic index (GI) and Glycemic load (GL) e.g. Wheat has 73 GI and 10 GL [15], and Rice has a range between 48-92 (average 70) GI [16]. Compared to them, *Yava* (Barley) has a very low GI (28 GI), which significantly lowers blood sugar. *Yava* has high-β-glucan, which decreases postprandial insulin hypersecretion, which may contribute to further prevention of Diabetes Mellitus type 2 and other metabolic syndrome, and improvement of insulin sensitivity with prolonged ingestion [17]. *Yava* flour can utilize in the forms of Chapati, Bread, Sattu; use whole *Yava* in the form of Khichadi and Gruel.

5. CONCLUSION

This is a conceptual article, the knowledge we gain from the study can be helpful in clinical practice. Analyzing the general qualities and effects of *Yava* (Barley) explores an obvious idea that *Yava* is best advised in *Prameha* (Diabetes mellitus), *Sthaulya* (Obesity) and *Medoroga* (dyslipidemia). Apart from all the *guṇas*, *Yava* is very dry in nature; always prepare food by adding any healthy *Snigdha dravya* e.g. *Tila taila* (Seasam oil) or *Go ghr̥ta* (Cow butter). *Tila taila*

or *Go ghr̥ta* considered a healthy fat for lifestyle disorders, can use in Diabetes mellitus.

CONSENT AND ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Tiwari, Ashok. Invigorated barley in diabetes. Current Science. 2008;95.
2. Available: <https://www.who.int/news-room/fact-sheets/detail/diabetes>
3. Moien Abdul Basith Khan, Muhammad Jawad Hashim, Jeffrey Kwan King, Romona Devi Govender, Halla Mustafa, Juma Al Kaabi; Epidemiology of Type 2 Diabetes – Global Burden of Disease and Forecasted Trends; J Epidemiol Glob Health. 2020 Mar;10(1):107–111. DOI: 10.2991/jegh.k.191028.001
4. Minaiyan M, Ghannadi A, Movahedian A, Hakim-Elahi I. Effect of *Hordeum vulgare* L. (Barley) on blood glucose levels of normal and STZ-induced diabetic rats; Research in Pharmaceutical Science. 2014 May-Jun;9(3):173–178.
5. Minaiyan M, Ghannadi A, Movahedian A, Hakim-Elahi I. Effect of *Hordeum vulgare* L. (Barley) on blood glucose levels of normal and STZ-induced diabetic rats; Research in Pharmaceutical Science. 2014 May-Jun;9(3):173–178.
6. Available: <https://www.who.int/news-room/fact-sheets/detail/diabetes>
7. Tiwari, Ashok. Invigorated barley in diabetes. Current Science. 2008;95.
8. Suśruta. Suśruta Saṁhitā, 'Āyurveda tattva sandīpikā' hindi commentary by Shastri AD, Part- I (Sutra, Nidāna, Śārira, Cikitsā, Kalpa sthānas), Chaukhamba Sanskrit Sansthan, Varanasi- 221001; 2014.
9. Sharma PV. Dravyaguṇa Vijñāna, Volume-II, 17th edition, Chaukhamba Bharati Academy, Varanasi- 221001; 1996.

10. Amna Azam, Nizwa Itrat, Uswa Ahmed. Hypoglycemic effect of barley (*Hordeum vulgare*) in diabetics. International Journal of Innovative Science and Research Technology. ISSN No:-2456-2165. May-2019;4(5).
11. Kumar, Ashwani, Kumari, Pooja, Kumar, Mukul. Role of millets in disease prevention and health promotion; 2022. DOI:10.1016/B978-0-12-819815-5.00034-3.
12. Minaiyan M, Ghannadi A, Movahedian A, Hakim-Elahi I. Effect of *Hordeum vulgare* L. (Barley) on blood glucose levels of normal and STZ-induced diabetic rats. Research in Pharmaceutical Science. 2014 May-Jun;9(3):173–178.
13. Sharma PV. Dravyaguṇa Vijñana, 17th edition, Chaukhambha Bharati Academy, Varanasi- 221001, 1996;II.
14. Sharma PV. Dravyaguṇa Vijñana. 17th edition, Chaukhambha Bharati Academy, Varanasi- 221001. 1996;II.
15. Available:https://www.clevelandheartlab.com/wp-content/uploads/2021/03/Quest-CHL-Glycemic-Index.pdf
16. Kusmiyati F, Lukiwati DR, Kristanto BA, Herwibawa B. Glycemic index of ten commercially Indonesian rice cultivars. IOP Conference Series: Earth and Environmental Science; 2019.
17. Yukie Fuse, Mariko Higa, Naoko Miyashita, Asami Fujitani, Kaoru Yamashita, Takamasa Ichijo, Seiichiro Aoe, Takahisa Hirose. Effect of high β -glucan barley on postprandial blood glucose and insulin levels in type 2 diabetic patients. Clinical Nutrition Research. 2020 Jan;9(1): 43–51.

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