Assessment of Medovaha Srotodushti in Madhumeha (Diabetes Mellitus) in Context with Hba1c

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Abstract: The study presents a fusion of Ayurvedic principles and modern understanding of diabetes mellitus, focusing on the escalating global pandemic, particularly in India. It highlights the convergence of Madhumeha (diabetes) and Diabetes Mellitus through shared etiological factors, pathogenesis, clinical presentations, and complications, emphasizing the disruption of Medovaha Srotas (fat metabolism channels). The study underscores the potential of HbA1c as a dependable marker for diabetes control due to its ability to reflect long-term glycemic status, overcoming short-term dietary influences. The discussion section showcases a pivotal table illustrating the correlation between the severity of Medovaha Srotodushti and key diabetes markers, revealing a pattern that reinforces their interaction. Also, the critical role of Medovaha Srotas in diabetes progression and establishes a significant positive correlation between HbA1c levels and Medovaha Srotodushti manifestation, indicating its potential as an indicator for disease severity. The study’s clinical implications lie in early detection and Ayurveda-based management strategies, bridging traditional and modern approaches. Amid the global diabetes crisis, this research contributes an interdisciplinary approach and holistic insights to curb the escalating prevalence of diabetes. By connecting Ayurvedic wisdom with contemporary medical knowledge, it offers a pathway for comprehensive therapeutic strategies that transcend conventional boundaries.

Keywords: Madhumeha, Diabetes Mellitus, MedovahaSrotas, Medovaha Srotodashti, HbA1c.

1. Introduction

Ayurveda primary objective is to preserve the well-being of the healthy and eliminate ailments in the afflicted, rendering it a superior healthcare system compared to contemporary counterparts [1]. This observation-based health science was revered for its logical foundation in antiquity and continues to illuminate the present era.

Diabetes, a disorder arising from genetic predisposition and metabolic imbalances, has evolved into a global pandemic, straining public health systems [2]. Despite notable medical advancements, diabetes retains its status as a significant source of morbidity and mortality [3]. The highest surge in cases is anticipated in India, where an estimated 72.96 million adults will be affected [4]. While genetics play a role, negligence of inherited risk alongside unhealthy dietary habits exacerbates the condition. The genesis of the diabetes surge can be traced back to childhood, marked by busy parents resorting to nutritionally deficient fast foods like instant noodles. Reduced outdoor playtime in educational settings and confined living spaces foster sedentary indoor routines. The academic pressures borne by children also heighten their susceptibility to stress-related disorders, including diabetes. The younger generation’s dearth of physical activity, attributed to sedentary lifestyles and demanding professions, compounds the issue. This lifestyle characterized by stress and inactivity significantly contributes to the diabetes epidemic [5].

Addressing diabetes presents challenges for both modern medical practitioners and Ayurvedic experts, fostering exploration into alternative therapeutic avenues. Ayurvedic philosophy underscores the profound parallels between Madhumeha and Diabetes Mellitus, evident in their shared facets encompassing etiological factors (Nidana), pathogenesis (Samprapti), clinical presentation (Rupa), classification (Bheda), and complications (Upadraja) [6]. The root pathogenesis of Madhumeha revolves around the disturbance and accumulation of Medo Dhatu (adipose tissue) [7]. Particularly striking is the prominence of Medovaha SrotasDushti (disturbance in fat metabolism channels) as a distinctive etiological factor. Further resonance arises from the clinical features of Medovaha Srotodashti closely mirroring the prodromal manifestations (Purvarupa) of Prameha (Diabetes), encompassing polyphagia, polydipsia, polyuria, and asthenia [8, 9].

To mitigate the variability in blood glucose measurements stemming from preceding day’s dietary influences, empirical research has explored correlations with glucose measurements, proposing the utilization of HbA1c as an objective metric for glycemic control. This approach circumvents the transient effects of short-term dietary variations, bolstering the consistency of diabetes management [10].

In summation, the convergence of Ayurvedic constructs, particularly Madhumeha, and contemporary Diabetes
Mellitus underscores shared attributes spanning causal factors to clinical presentations. Harnessing HbA1c as a dependable glycemic marker enhances the capacity for standardized and objective diabetes monitoring. In an era marked by interdisciplinary synergy, these insights illuminate avenues for comprehensive therapeutic strategies that transcend conventional boundaries.

2. Material and Method

The materials used for the study is categorized under the following headings:

Literary sources - For the present study, literary data was obtained from Vedic scriptures, Ayurvedic Samhitas, and Sanskrita dictionaries. Retrospective study of database books related to modern science, research studies published in peer-reviewed journals and conference proceedings and various web-resources like Google, DHARA etc. was done for seeking information about related research works.

Clinical study-A total of 100 patients with classical features of Diabetes Mellitus attended the OPD and IPD of Rog Nidan department at Rishikul Campus Hospital, UAU, Haridwar. They were randomly selected for this study, regardless of their sex, religion, occupation, etc.

Assessment tools – Clinical features, subjective and objective parameters.

Clinical Study

Selection of patients

A total of 100 patients with classical features of Diabetes Mellitus is selected, out of which, 85 patients who fulfilled the inclusion and exclusion criteria were registered for the study and evaluated in detail based on the questionnaire on Medovaha Srotodushiti assessment criteria.

Criteria for selection of patients

1) Inclusion criteria-
   - Male or female between the age group of 16 - 70 years
   - Patients with an increased level of HbA1c and Fasting blood sugar.

2) Exclusion criteria-
   - Patients below 15 years and above 70 years of age.
   - Patients having IDDM, juvenile diabetes, Gestational diabetes mellitus
   - Patients with Diabetic retinopathy, nephropathy, neuropathy.
   - Patients with Genetic syndrome, drug-induced obesity and neuroendocrine disorder

Criteria for assessment-

The assessment for study was done of following criteria-

1) Subjective criteria- Questionnaire and personal observation of Diabetes mellitus symptoms, Medovaha Srotodushiti Lakshana mentioned in classics.

2) Objective criteria- Blood sugar (Fasting), Blood sugar (Post-Prandial), HbA1c.

Table 1: Medovaha Srotodushiti Assessment Questionnaire

<table>
<thead>
<tr>
<th>S. No.</th>
<th>QUESTIONS</th>
<th>Present</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Javopradha (Lack of enthusiasm)</td>
<td></td>
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<tr>
<td>2.</td>
<td>Krukhryavayata (Lack of sexual activities)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Dourbalya (Weakness)</td>
<td></td>
<td></td>
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<tr>
<td>4.</td>
<td>Dourgandhya (Foul smell)</td>
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<tr>
<td>5.</td>
<td>Svedabadiha (Uncomfortable due to sweating)</td>
<td></td>
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</tr>
<tr>
<td>6.</td>
<td>Kshudatimatra (Polyphagia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Pipasatimatra (Polydipsia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Jallilibhaveshe (Complex hair)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Madhurasya (Sweet taste of mouth)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Kara Daha (Burning sensation in hand)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Pada Daha (Burning sensation in feet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Kara Suptta (Numbness in hand)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Pada Suptta (Numbness in feet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Mukhatalukantha Sosha (Dryness of mouth)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Alasya (Feeling of laziness)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Malinkayecchidraupdeha (Ugly appearance due to excess secretions of mucous from orifices of the body)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Angaparidahaa Suptta (Feeling of burning sensation and numbness of body parts)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Shutpadapilika Sharira Abhisarnam(Roaming or attracting of fly, ant, butterflies, etc towards the patient’s body)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Mutre Ch Mutredoshan(Change in the normal physical appearance of urine)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Visra Shariragandha(Foul smell)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Atinidra(Excessive sleep)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Tandra(Drowsiness)</td>
<td></td>
<td></td>
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</tbody>
</table>

3. Observations and Results

In this study we observed that prevalence of the disease is higher in male i.e., 62.35% and 37.65% were female. The highest percentage of cases (40.00%) is observed among individuals engaged in service-oriented occupations. Business-related occupations closely follow, accounting for 32.94% of the cases. The highest percentage of cases (83.53%) is observed in the middle socioeconomic status group. Individuals in the lower socioeconomic status group...
It's worth noting that HbA1c, serving as an indicator of Lakshana elevated correlation signifies that higher HbA1c levels correspond to moderate positive correlation was identified in the range of HbA1c levels spanning from 10.1 to 14.0, a manifestation of established between HbA1c levels and the clinical severity, substantiating the traditional understanding.

Moreover, the tabulated data reveals the distribution of Medovaha Srotadushti severity, elucidating that the majority of patients exhibit a moderate level of Dushti (54 patients) followed by mild (13 patients) and severe (18 patients) categories. This observation resonates with the comprehensive study's findings, reinforcing a significant positive correlation between Medovaha Srotadushti and the aforementioned blood sugar markers. This congruence implies that an escalation in blood sugar levels is accompanied by an intensification of Medovaha Srotadushti severity, substantiating the traditional Ayurvedic understanding.

Of notable significance is the statistically significant linkage established between HbA1c levels and the clinical manifestation of Medovaha Srotadushti. Particularly, within the range of HbA1c levels spanning from 10.1 to 14.0, a moderate positive correlation was identified. This correlation signifies that higher HbA1c levels correspond to elevated Medovaha Srotadushti severity. This finding aligns seamlessly with the discussion previously elaborated upon, highlighting the progression of Medovaha Srotadushti Lakshana paralleling the severity escalation of Madhumeha. It's worth noting that HbA1c, serving as an indicator of blood sugar control over an extended period, illustrates the potential impact of persistent elevated blood sugar levels on vascular and neural health, ultimately manifesting as Medovaha Srotadushti Lakshana and other diabetes-related complications.

The clinical implementation of these findings holds immense potential. By recognizing HbA1c as a marker intricately connected to the vitiation of Medovaha Srotas, clinicians can obtain valuable insights into the severity and progression of diabetes. This connection offers a pathway to identifying early indicators of the disease and implementing interventions rooted in Ayurvedic principles. By harnessing this understanding, healthcare practitioners can not only work towards preventing the onset of diabetes but also devise strategies to effectively manage the condition.

### Table: Correlation Matrix

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t</th>
<th>p</th>
<th>r</th>
<th>r^2</th>
<th>Adj r^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medovaha Srotadushti</td>
<td>8.291</td>
<td>1.904</td>
<td>4.355</td>
<td>&lt;0.001</td>
<td>0.166</td>
<td>0.0274</td>
<td>0.0157</td>
</tr>
<tr>
<td>HbA1c</td>
<td>0.308</td>
<td>0.201</td>
<td>1.53</td>
<td>0.13</td>
<td>0.0274</td>
<td>0.0157</td>
<td></td>
</tr>
</tbody>
</table>

B^* = Bivariate Linear Regression Coefficient

### 5. Discussion

The provided table serves as a pivotal representation, showcasing the intricate relationship between the severity of Medovaha Srotadushti and key marker of diabetes control i.e., HbA1c levels. A discernible pattern emerges, indicating that as these markers elevate, so does the severity of Medovaha Srotadushti.

Moreover, the tabulated data reveals the distribution of Medovaha Srotadushti severity, elucidating that the majority of patients exhibit a moderate level of Dushti (54 patients) followed by mild (13 patients) and severe (18 patients) categories. This observation resonates with the comprehensive study's findings, reinforcing a significant positive correlation between Medovaha Srotadushti and the aforementioned blood sugar markers. This congruence implies that an escalation in blood sugar levels is accompanied by an intensification of Medovaha Srotadushti severity, substantiating the traditional Ayurvedic understanding.

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### 6. Conclusion

The intricate role of Medovaha Srotas in the progression of Madhumeha (diabetes mellitus) emerges as a pivotal finding in this study. This investigation underscores that the vitiation of Medovaha Srotas plays a significant role in driving the development of this metabolic disorder.

HbA1c, a reliable blood test reflecting average blood sugar levels over a span of three months, emerges as a potent indicator of diabetes control. As elucidated through this study, the disruption of Medovaha Srotas can lead to heightened blood sugar levels, thereby influencing an increase in HbA1c values. Thus, the study establishes a compelling link between the perturbation of Medovaha Srotas and the subsequent elevation of HbA1c levels.

The clinical implementation of these findings holds immense potential. By recognizing HbA1c as a marker intricately connected to the vitiation of Medovaha Srotas, clinicians can obtain valuable insights into the severity and progression of diabetes. This connection offers a pathway to identifying early indicators of the disease and implementing interventions rooted in Ayurvedic principles. By harnessing this understanding, healthcare practitioners can not only work towards preventing the onset of diabetes but also devise strategies to effectively manage the condition.
The imperative behind this study stemmed from the need to comprehend the dynamic relationship between HbA1c levels and Medovaha Srotodushi. The overarching aim was to discern early markers that could potentially serve as warning signs for diabetes, ultimately laying the foundation for Ayurvedic-based interventions. With diabetes evolving into a global public health concern, this study fills a crucial gap by providing a holistic perspective and fostering strategies to combat its escalating prevalence.

7. References


Author Profile

Dr. Saurabh Garg attained his Bachelor of Ayurvedic Medicine and Surgery (BAMS) degree in 2020 from Pt. B.D. Sharma University of Health Science, Rohtak. Presently, he is diligently working towards his master's degree in the Department of Clinical Diagnosis and Pathology (Rog Nidan Evum Vikriti Vigyan) at Rishikul Ayurvedic College, affiliated with Uttarakhand Ayurveda University in Haridwar.

Prof. (Dr.) Ruby Rani Aggarwal completed her Bachelor’s degree in Ayurvedic Medicine and Surgery (BAMS) from Kanpur University in 1992 and her Master’s degree in Clinical Diagnosis and Pathology from the National Institute of Ayurveda, Jaipur. Since 1999, she has held various academic and administrative positions and supervised approximately 9 research projects. She has published more than 30 research papers. Currently, she is the Head of the Department of Clinical Diagnosis and Pathology at Rishikul Ayurvedic College, UAU, Haridwar and has been actively involved in the medical profession for the past 24 years.