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A Clinical Study on the Efficacy of *Hemadrumasyadi* Decoction on *Apathya nimittaja prameha* (Type II Diabetes Mellitus)

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Abstract

Incidence of Diabetes Mellitus (DM) is rapidly rising at an alarming rate all over the world and in Sri Lanka. It downgrades the quality of life of people. Management of Diabetes Mellitus is one of the challenging health issues faced by health professionals. Hence, alternative systems of medicine are being explored to fill the gap of its management. Prameha has been described in Ayurveda for thousands of years ago. *Apathya nimittaja prameha* (ANP) is caused by unhealthy dietary and lifestyle factors and it is well correlated with type II DM. Ayurveda possesses a number of valuable remedies that can be used in the management of ANP. The objective of the present study is to evaluate the effect of *Hemadrumasyadi* Decoction (HD) on Type II DM. Selected patients (n=30) were treated with HD 120 ml, with 10 ml of bee honey before meals, twice a day for four weeks. All the patients were assessed for quantitative and qualitative parameters, before and after the treatment to evaluate the effect of decoction. Data were analyzed with SPSS software. Present study has revealed that Type II DM is more common among 40–60 age group (78%) and people who engaged in mental labour dominant occupations (74%). Sedentary life style (72%) and excessive intake of fatty and sweet foods have found to be the leading causative factors. Pitta-Kapha type of prakriti is more prone to have ANP (63.3%). HD produced highly significant (p<0.001) improvement in polyuria, polydipsia, fasting blood sugar (FBS), total cholesterol and low density lipoprotein (LDL) whereas significant (p<0.05) improvement in fatigue, burning sensation in hands and feet, high density lipoprotein (HDL). Finally, it is concluded that *Hemadrumasyadi* Decoction is effective in improving some parameters of Type II DM significantly.

Keywords: Prameha; *Apathya nimittaja prameha*; Diabetes Mellitus; *Hemadrumasyadi* Decoction.

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Introduction

Prameha is a group of diseases which is generally caused by inactivity and excessive consumption of food which aggravates the *kapha* and *medas*. The role of genetic and hereditary factors is described in the context of *sahajaprameha* while the role of high-calorie diet and sedentary habits is described in the context of *Apathya nimittaja prameha*.[1] This *Apathya nimittaja prameha* can be correlated with

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Type II Diabetes Mellitus.[2] Ayurveda explains the prodromal features and the characteristic symptoms of *prameha* clearly and objectively. Ten types of *kaphajaprameha* are said to be curable while the six types of *pittajaprameha* are said to be *yapya* (palliative). It is emphasized that the four types of *vatajaprameha* are incurable.[3]

According to Ayurveda, different lines of management are applied for the two types of *prameha*. In case of emaciated and weak patients (*krishapramehi*), *vrimhana* treatment (nourishing) is indicated while in case of strong and obese patients (*sthulapramehi*), *sanshodhana* treatment (purification) is recommended. *Sansamana* treatment (palliation) is recommended for the patient who doesn't suit for *sanshodhana*.[4] Furthermore, a number of herbal and herbo-mineral formulations are mentioned in texts which are having *pramehahara* (anti-diabetic) effect.

Hemadrumasyadi decoction is said to be an efficacious drug for *prameha* according to *Vaidyaka Sarasankshepa*.[5] Generally, the properties of the ingredients of decoction is capable of reliving *prameha*. With this perspective, this research was carried out to evaluate the effect of *Hemadrumasyadi* decoction on *Apattya nimittaja prameha* (Type II DM).

Objective of the study

The objective of this study is to evaluate the comparative effect of *Hemadrumasyadi* decoction on *Apattya nimittaja prameha* (Type II DM).

Materials and Methods

This study is a clinical study for which thirty (30) *Apathya nimittaja prameha* (Type II DM) patients of both sexes, within the age of 30–60 years, having a fasting blood sugar level within the range of 126–200 mg/dl and with a chronicity less than 5 years were selected from the OPD of D.B. Welagedara Ayurveda Hospital, Kurunegala, Sri Lanka. Selected patients were treated with *Hemadrumasyadi* decoction at the dose of 120 ml of decoction with 10 ml of bee honey in the morning (6.00 am) and evening (6.00 pm), before meals for a period of four weeks. FBS, lipid profile and clinical symptoms with proper grading were evaluated before and after treatment. After completing the treatment, the patients were followed-up for four weeks. The treated patients were kept on specific diabetic diet and exercise during the period of treatment and follow-up. Qualitative data were analyzed by Wilcoxon Rank test and Mann-Whitney test whereas quantitative data were analyzed by paired and unpaired t-tests by SPSS software.

Result on the effect of Hemadrumasyadi Decoction on Apattya nimittaja prameha (Type II DM)

In this study, 30 patients of *Apattya nimittaja prameha* (Type II DM) were treated with *Hemadrumasyadi* decoction for a period of 4 weeks. The obtained results are tabulated as follows.

HD reduced *prabhutamutrata* and *trishnadikya* in statistically highly significant manner ($p<0.001$) whereas the reduction of *shrama* and *karapadadaha* is statistically significant ($p<0.05$). The reduction of *pindikodveshtana* is statistically insignificant ($p>0.05$) (Table 1).

HD has reduced fasting blood sugar which is statistically highly significant ($p<0.001$) whereas the reduction of total cholesterol, triglycerides and LDL which is highly significant ($p<0.001$) and the increase of HDL is significant ($p<0.05$) (Table 2).

HD has reduced BMI which is statistically significant ($p<0.05$) whereas the reduction of systolic blood pressure, diastolic blood pressure and pulse rate is insignificant ($p>0.05$) (Table 3).

Table 1: Effect of *Hemadrumasyadi* Decoction on Clinical Features of ANP

Clinical Features	Mean ± SD		Mean difference ± SD	SE	t	*p*
	BT	AT				
Prabhutamutrata	1.40 ± 0.51	0.53 ± 0.74	0.87 ± 0.35	0.09	9.54	$p<0.001$
Trishnadikya	1.47 ± 0.52	0.40 ± 0.51	1.07 ± 0.46	0.12	9.03	$p<0.001$
Shrama	0.47 ± 0.52	0.13 ± 0.35	0.33 ± 0.49	0.13	2.65	$p<0.05$
Pindikodveshtana	0.13 ± 0.35	0.07 ± 0.26	0.07 ± 0.26	0.07	1.00	$p>0.05$
Kara padadaha	0.73 ± 0.59	0.20 ± 0.41	0.53 ± 0.52	0.13	4.00	$p<0.05$

Table 2: Effect of *Hemadrumasyadi* Decoction on Fasting Blood Sugar and Lipid Profile

FBS	Mean ± SD		Mean difference ± SD	SE	t	*p*
	BT	AT				
Fasting Blood Sugar (mg/dl)	144.11 ± 14.26	122.54 ± 18.61	21.57 ± 6.62	1.71	12.63	$p<0.001$
Total cholesterol (mg/dl)	184.01 ± 15.19	173.61 ± 15.19	10.41 ± 3.56	0.93	11.19	$p<0.001$
Triglycerides (mg/dl)	102.93 ± 11.59	96.24 ± 10.21	6.69 ± 3.11	0.80	8.34	$p<0.001$
LDL cholesterol (mg/dl)	109.69 ± 13.76	101.75 ± 13.31	7.94 ± 3.78	0.98	8.13	$p<0.001$
HDL cholesterol (mg/dl)	53.79 ± 2.53	54.61 ± 2.31	–0.82 ± 0.82	0.21	–3.88	$p<0.05$

Table 3: Effect of *Hemadrumasyadi* Decoction on BMI, Blood Pressure and Pulse Rate

Parameter	Mean ± SD		Mean difference ± SD	SE	t	*p*
	BT	AT				
BMI (kg/m2)	22.67 ± 2.01	22.41 ± 1.92	0.25 ± 0.33	0.08	3.00	$p<0.05$
Systolic BP (mm Hg)	115.33 ± 7.43	114.67 ± 6.39	0.67 ± 2.58	0.67	1.00	$p>0.05$
Diastolic BP (mm Hg)	74.67 ± 6.39	73.33 ± 4.88	1.33 ± 3.52	0.91	1.47	$p>0.05$
Pulse rate (min^{-1})	69.60 ± 2.03	69.33 ± 2.09	0.27 ± 0.70	0.18	1.47	$p>0.05$

Discussion

Since antiquity, Ayurvedic scholars had the knowledge of *prameha*, a disease which can be correlated with Diabetes Mellitus. *Prameha* is considered a "*Maharoga*" according to Ayurveda emphasizing the seriousness of the disease.[6] *Apattya nimittaja prameha* is a type of *prameha* caused by the improper dietary and lifestyle factors. Person who suffer from *Apattya nimittaja prameha*[7] resembles with "*Sthulapramehi*".[8] This condition can be further described as a *Santarpanajanyakapha-pitta* state of *parameha*[9] meaning *kapha-pitta* type of *prameha* caused by *santarpana* (over nutrition). It should be treated by *Apatarpana* (desaturation/ depleting) in accordance with both Susruta and Charaka.[10] *Kapha* and *meda* are mainly affected in this disease.[11] *Mandagni* (diminished bio-fire), production of *Ama* (autotoxins) and *srothorodha* (obstruction of channels) play a major role in the pathogenesis of *Apattya nimittaja prameha*[12] which is mainly caused by *kapha* and *meda* producing food and activities.[13] The risk factors of Type II Diabetes Mellitus are middle age, obesity, physical inactivity and excessive intake of high calorie diet (sweet foods rich in refined carbohydrate, high-fat foods).

Discussion on demographic data

The middle-aged and elderly people are mainly affected by Type II DM[14] which is validated by the present study where 80% of the participants were within the age 40–60 years. Though Type II DM is known to develop in equal rates in both women and men,[15] majority of the participants (63.3%) were female in this study. The 80% of the patients were in the middle and upper middle socio-economical classes. Sedentary lifestyle is a major risk factor of *Apattya nimittaja prameha* according to Ayurveda[16] which is supported by the present study that 70% of the patients have engaged in mental labor dominant occupations.

Considering the clinical presentation[17], *prabhtamutrata* (100%), *trishnadikya* (100%), *karapadadaha* (70%)[18], *shrama* (53.3%) and *pindikodveshtana* (16.7%) were the most common symptoms of *prameha*. Chance of developing Type II Diabetes is also influenced by genetic/hereditary factors[19] which is validated by the present study where 50% of the patients had a family history of Type II DM.

In case of personal history, all the patients had mixed type of diet (100%), *madhyakoshta* (90%), no exercises (83.3%),[19] tea (96.7%) and sweets[19] (53.3%) which increase *kapha.*[16]

Excessive consumption of *athidrava* (76.7%), *snigdha* (73.3%), *madhura, amla* and *lavana* were among the majority of patients which help increase *kapha*.[20] Sleeping during day time is a leading causes of *prameha* according to Ayurveda[21] which is supported by the present study that 23.3% of patients had *divanidra* (day sleeping). The majority of patients had *pitta-kapha* (63.3%) type of *prakriti.* The 96.7% of the patients were in the normal range of BMI (18.5–24.9 kg/m^2) and only 3.3% of the patients were in the range of overweight (25.0–29.9 kg/m^2 of BMI). Obesity is a known risk factor of Type II DM which increases risk tenfold (BMI>30kg/m^2) when comparing with normal people.[19]

Discussion on the effect of the treatment

When considering *prameha, kapha, pitta, vata, meda, rakta, sukra, ambu, vasa, lasika, majja, rasa, oja* and

mansa are involved in its pathogenesis where *kapha* and *meda* are the mainly affected. Diminished *agni* obstructs the channels producing *ama*.[22] Therefore, eradicating *ama* is of gtreat importance in the management of *Apattya nimittaja prameha* . *Langhana* is the main method of treating *ama* state; hence, the application of *langhana* is essential for the disease.[9]Acharya Susrutahas recommended *apatarpana* for *Apattya nimittaja prameha* [23] The *dravya* which are having *dipana*, *pachana* and *srotosodhana* properties are beneficial in the management of this disease.[9]

Discussion on the effect of Hemadrumasyadi Decoction (HD)

Hemadrumasyadi Decoction reduced *prabhutamutrata, trishnadikya,* fasting blood sugar, total cholesterol, triglycerides and LDL which is statistically highly significant (p<0.001) whereas the reduction of *shrama, karapadadaha* and BMI, and the increase of HDL is statistically significant (p<0.05). HD reduced *pindikodveshtana,* systolic blood pressure, diastolic blood pressure and pulse rate but, which is statistically insignificant (p>0.05).

Hemadrumasyadi Decoction consists of *kashaya* (85.7%), *tikta* (71.4%), *madhura* (57.1%) and *katu* (28.6%) *rasa*; *laghu* and *ruksha* (100% each) *guna; shita* (57.1%) *virya* and *madhuravipaka* (57.1%). Based on its pharmacodynamics properties, HD is having *tridosahara,* specially *kapha-pitta samaka, dipana, pacana, yakrututtejaka, pramehaghna, mutrasangrahaniya, trishnanigrahana, dahaprasamana, mutrasodhana* and *yogavahi* effects. *Madhu* (bee honey) is used as the *anupana* (vehicle) of *Hemadrumasyadi* decoction. Due to its pharmacodynamic properties including the *yogavahi* effect, *madhu* improves the efficacy of HD decoction.

Further, *Thriphala* is found to have antioxidant, hypoglycemic and hypolipidemic effects. An investigation done on the aqueous extraction of various parts of *Cassia auriculata* (*Hemadruma*) has revealed that it has the antidiabetic, hypolipidemic and antioxidant effects.[24] *Andrographis paniculata* (*Kalamegha*) has antioxidant, anti-inflammatory, immunomodulatory, hepatoprotective, anti-hyperglycemic and hypolipidemic effects.[25] These actions of HD break the pathogenesis of *Apathya nimittaja prameha* by which the diseasesis relieved.

Conclusion

In nutshell, *Hemadrumasyadi* decoction is found to be effective on improving subjective as well as objective parameters of *Apattya nimittaja prameha* (Type II DM) significantly. The effect of the decoction is expounded on the basis of their pharmacodynamic properties such as *rasa, guna, virya*, and *vipaka*. But, its scientific mode of action is unidentified. Therefore, further scientific studies are needed to evaluate the mode of action of *Hemadrumasyadi* Decoction on *Apattya nimittaja prameha*

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