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PRE PRAMEHA RISK SCORE MODEL DESIGN

Shweta Dewan[1], B. C Arya[2], Baldev Kumar[3], Sonali[4]

[1]Ph.D Scholar, Department of Basic Principles, National Institute of Ayurveda, Jaipur, Rajasthan, India
[2]Associate Professor, B. P. S, Mahila Ayurveda University, Khanpur Kalan, Sonepat, Haryana, India
[3]Director, AYUSH, Govt. of Haryana, Associate Professor, Department of Basic Principles, National Institute of Ayurveda, Jaipur, Rajasthan, India
[4]Assistant Professor, Department of Dravya Guna, LBS Ayurveda Medical College, Bilaspur, Chattisgarh, India

Email: arorau51@yahoo.com

ABSTRACT

Introduction: Ayurveda being a traditional health system of India define its contribution by implementation of prevention aspect and adding Quality of life (QOL) in a Diabetic/*Prameha* patient. Several diabetes risk score or risk engines have been developed since the last decade. In India various studies have been done on Indian Diabetes Risk Score developed by Dr. V. Mohan. For a more prolific picture of *Prameha* as per previous researches done at renowned research institutions in India and knowing the risk factors involved in its pathogenesis, there arises a need of introduction of Pre *Prameha* Risk Score Model based on scientific guidelines. A practical tool is needed to predict *prameha* risk. **Aims and objectives:** To identify and investigate the relation of those various risk factors found and their percentage of relevance in *prameha* risk subjects, to distinguish between the modifiable and non-modifiable risk factors so that proper interventions can be made timely for effective management later on. **Materials and Methods**: Total 776-research works reported on *prameha* were screened from different departments throughout the colleges all over India. Duplicated data was removed (127) and out of that 649 thesis, a meta-analysis of 85 thesis of MD/ PhD scholars from different departments of National Institute of Jaipur was done for the present study. **Results:** After the statistical analysis *sharirika prakriti, manasika prakriti, Sthaulya, family history, vaya, vayayama,* predominance of *rasa* came out to be effective risk factors contributing to 6.20%,10.04%,4.52%,5.3%,7.9%,4.92% of the study causing *prameha*. A Scorecard of 122 points was developed indicating the severity of factors. If the score is more than half i.e 61 points and above, patient considerably falls in high-risk category. **Conclusion:** It is recommended to refer the scorecard to predetermine the risk of *prameha* in the population with the application of this tool.

Keywords: *Prameha*, Score, Risk, meta-analysis

INTRODUCTION

WHO reported in year 2000, 171 million people were suffering from Diabetes (2.8% of the population). Of these 31.7 million were Indians. The global prevalence of diabetes among adults (aged 20–79 years) by 2010 was estimated to be 6.4%, affecting 285 million adults, and projected to be 7.7% of (439 million) adults by 2030.[1] Over 60% of health care costs are used in inpatient settings, suggesting that treating complications of diabetes was a major cost factor in developed countries.[2,3,4] Government of India is already taking up the issues of Diabetes as a major health concern for the population and introduced various health policy programs like National Diabetes Control Program in the past. Ayurveda being a traditional health system of India can contribute to this grievous disease by implementation of prevention aspect and catering to Quality of life (QOL) of a Diabetic/*Prameha* patient. Indian Government celebrated its first National Ayurveda Day on 28-11-2016 with a basic theme of Diabetes/ *Prameha*. The national level research organizations of Ayurveda in India like CCRAS, ICMR are engaged in intensive R&D in the field of *Prameha* to bring out effective methods to diagnose the *prameha* patients in apt time and finding the cost effective methods to find them among the non diabetic population.

Prameha in Ayurveda has been classified as *anushangikanam* implying it has a relapsing nature.[5] It is regarded as one of the *Mahagada* (diseases that are exceedingly troublesome) in *Brihtaryi*[6] which gives a direction to the physicians in connection with the different treat-

ments for the same disease and also that they need an essential intervention of *rasayana* therapy in current line of treatment. *Chakrapani* explained the term *anushangi* as 'Punarbhavi', means a disease that presents itself repeatedly. *Gangadhara* has explained *Anushangi* as a disease that remains attached forever. All these factors themselves are sufficient to get a hint about the dreadfulness of disease. *Prameha* can be classified under non-communicable diseases (NCD), which are taking a toll on global health. In NCDS, the role of risk factors is considerable in arresting the disease to further stages or diseases by giving an idea of state of subjects if identified on time. The risk factor approach needs aggressive identification for planning prevention strategies and for early diagnosis. Several diabetes risk score or risk engines have been devised for the last decade. They have been devised for prevention programs in the USA, Scandinavia and U.K. The ADA website has a simple questionnaire for general population which is based on age.[7] In India various studies have been done on Indian Diabetes Risk Score developed by Dr. V. Mohan etal[8]. The sensitivity and specificity of the test is clearly evident from the number of studies testing its reliability and the results are profound. It is a novel thought to produce such type of risk score for *prameha* based on research work that has been reported in the various universities of Ayurveda throughout India. An effort has been made to develop a *Prameha* risk score by using the scientific statistical analysis in the present study to rule out the potential high risk

patients out of the population who are more vulnerable to get *prameha*. The western medicine has so many popularized risk models for various diseases.

A practical tool is needed to predict *prameha* risk. Though they have been clearly defined in classics as *Acharya Charaka* has hinted that those who have voracious appetite and have aversion towards physical activities or are less enthusiastic, are over unctuous in nature are high-risk subjects for the *prameha* disease[9] However, the need of the hour is to produce evidence-based calculations for the same. Now, the major task for AYUSH practitioners is to identify individuals who would benefit from intensive lifestyle counselling by early intervention in high-risk patients by application of this tool. In addition, it is a simple, fast, inexpensive and non-invasive.

Objectives of Pre *Prameha* Risk Score:
- To identify various risk factors involved in the pathogenesis of *Prameha*.
- To investigate the relation of those various risk factors found and their percentage of relevance in *prameha* risk subjects.
- To distinguish between the modifiable and non-modifiable risk factors so that proper interventions can be made timely for effective management later on.
- To sort out the high risk subjects with calculations and further recommending them for proper management of the disease.

Materials and Methods:
Total 908 research work on *prameha* was identified from various resources like internet database and central library of institutes like National Institute of Ayurveda, Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat, Rajiv Gandhi Govt. Post Graduate Ayu. College Paprola, Himachal Pradesh. Government Ayurvedic College, Ahmedabad, Gujrat. Ayurveda researches online that are being done at various institutes of India on the desired topic by accessing the link.[10] The records that were duplicated were removed (259). Out of that 649 thesis, 85 thesis of MD/ PhD scholars were collected from different departments of National Institute of Jaipur for the present study including the data fields to be *prameha*/*meha*/ *madhumeha*/ diabetes mellitus/ metabolic syndrome. Out of 85 thesis 28 thesis of them were found to be useful for the present study to develop Pre *Prameha* Risk Score. Flow diagram is attached for better look. (**Illustration No.1**)

Inclusion criteria: All the dissertations carrying the word *prameha*/*meha*/ *madhumeha*/ diabetes mellitus/ metabolic syndrome/ hypoglycemia, anti hyperglycemia in their title of the research work reported.
Thesis with the electronic database available at the IT center of the institution for the easy access of the data.

Exclusion criteria: All the dissertations/ thesis reported without the search word in their title.

Materials and Methods:
- Data of *prameha*/diabetes were collected form 28 thesis of NIA and arranged in a Microsoft excel sheet.

- For each data value (from the previous thesis works done at NIA) and for every individual parameter, from their respective total patients (n): percentage, *prameha* score, risks score and odds ratio were calculated. The parameters were smoking, family history of diabetes, age/ *vaya*, Type of *rasapradhana* diet, exercise/*vyayam*, type of *prakritisharirika* and *manasika*, gender. etc.
- New subgroups were formed to short out the data in summarized form.
- Percentage of all parameters included in this study were calculated by the total of percentage column and *prameha* score column and then again taking out the percentage, using these totals to equalize the data for all the parameters.
- The calculated data was used to generalize this study and to make results.

Statistical analysis

Statistical analysis was performed using SPSS PC Windows version 10.0

Same data were not included in this study

In thesis no. 7, table no. 3.24 WHO data was included so it was excluded in this study.

In thesis no.11 Table 29, 30 were readings of only BMI average, not patient no. so not included in this study.

Thesis no. 2 and 20 were having same parameters table so not included in the study.

The *Prakriti* parameter in thesis no. 12 and 14 were same so excluded in the study.

In thesis no. 12, 14 and 16 the *Prakriti* parameter were approximate same, but in this study, we included the data of thesis 12 and 16, because these data were not exactly same.

In thesis no. 11 and 12 the age parameter were approx. same, but included in study because data was not exactly same.

In thesis no. 12 and 14, the addiction data were same.

PARAMETERS FOUND RELEVANT AFTER ANALYSIS (Illustration No.2)

SHARIRIKA PRAKRITI **AND** *PRAMEHA*:

The *prakriti* (type of constitution) of a person is quite capable of providing a fair indication of physiological strengths and weaknesses, mental tendencies, and susceptibility to illnesses of various types. The susceptibility to different diseases depends upon the type of *prakriti* constitution in an individual. Person with *kaphajaprakriti* are more susceptible to gain weight. All the ten qualities of *kapha* are manifested in form of some characteristics in a person. *Kapha* is unctuous, smooth, soft, sweet, firm, dense, slow, stable, heavy, cold, viscous and clear. a man having *kaphaja* type of constitution is endowed with the excellence of strength, wealth, knowledge, energy, peace and longevity.[11] Persons resembling *kapha* constitution resemble *Brahma, Rudra, Indra, Varun*, Lion, horse, elephant, bull, *garuda* and swan. Ancient Gods enlisted are worshipped according to Indian mythology. Lord *Varun* is God of water.[12]All have one thing in common that is they are related to *jalamahabuta* in one way or the other. They animals listed have their habitat in or around water. They don't

stray or move and settle in some localised area until there is scarcity of food.[13] Similar pattern in seen the horses and swans. *Jala mahabhuta* signifies the liquefied *kapha* in the body of *prameha* patients as only this specific characteristic is essential for the initiation of the disease.person with *pittaja* constitution is more prone to angry situations and this fact is a triggering point in the inception of *prameha* disease. *Pittadosha* is aggravated by anger.Anger frequently contributes to diabetes burnout, a person's anger may encourage them to seek freedom from the condition and neglect their self-management. It must be noted that anger is a natural emotion that has its uses in human existence, yet if not controlled, can lead to negative effects on health and social relationships.[14] A person having a combination of *kapha* and *pitta* characteristics is vulnerable for the disease. The fast movement is innate quality of *vatadosha*, which is made from *vayu* and *akash mahabhuta.* In a person having a constitution mixture of *vatadosha* and *pittadosha*, the same phenomenon occurs but at a more intense level. *Vata* is exceedingly *yogavahi* i.e which accentuates the properties of others in nature. In combination it produces both the type of effects. E.g when combined with *tejas* it produces burning sensation and when combined with soma it produces a cooling effect. In *prameha* when the body *drava* part is already increased. *Pitta* adds to the *drava* part more. And *vata* having a *yogavahi* property accentuates the *pitta* property more and therefore in such persons the probability of getting *prameha* disease is more.

MANASIKA PRAKRITI AND *PRAMEHA*:
Since mind is not separated from the body and both share an intimate relationship with each other. Every disease described in classics has a psycho somatic relationship. Compassion, tendency to proper distribution of food, forgiveness, truthfulness, righteousness, faith, knowledge, intellect, retentive faculty of mind, memory, restraint and non attachment these are the qualities of person predominant with *satva guna*. Mostly unhappy, roaming, impatient, egoistic, falsehood, cruelty, fraudulent, exhilarated, lust and anger are the qualities of people predominant with *rajas guna*. Sadness, nihilistic attitude, tendency to unrighteousness, blocking of intellect, ignorance, wickedness, inactivity and sleepiness these are tamas qualities of people.[15] According to contemporary reviews, emotional illness is associated with both poorer metabolic control and the increased report of clinical symptoms of diabetes.[16] MDD (Multi Depression disorder) in diabetic individuals represents a multi-determined phenomenon resulting from interactions between biologic and psychosocial factors. This interaction may increase the probability of developing type 2 diabetes in otherwise healthy individuals.[17] The oxidative stress may be a common pathway relating diverse seemingly distinct mechanisms proposed for the pathogenesis of complications in diabetes.[18] The people possessing the qualities of *rajas* and *tamas* are the vulnerable towards getting the disease. All the factors make a favourable condition for pathogenesis of *prameha* especially stress induced diabetes. Young people with age of less than 50 yrs are the main targets of these types of diabetes. The

modern sedentary lifestyle has inculcated many ill habits among the people. The greed, jealousy, anger, love, hatred, attachments are some of the emotions triggering stress which in turn causes diabetes.

MANASIKANIDANA AND PRAMEHA:
Mental activities like worry, grief, fear, anger and sorrow are described as causative factors for indigestion even if the wholesome food is taken in proper quantity.[19] They play a very important role in the progressive pathogenesis of *prameha*. *Acharyacharak* lays down their vital role by indicating the serene behaviour of *Acharyapunarvasu* to be free from delusion, ego, anger and attachment before familiarising the topic of *prameha* in the beginning of the chapter. These are the sole factors for triggering the pathogenesis of *prameha* as *kapha* cause *prameha* only when the former is excessively in liquid form. There is a predominance of *jalamahabhuta* in the body.[20]Also *vayudosha* is aggravated by passion, grief and fear, *pitta* by anger.[21] These factors trigger the other two *doshas* and aggravate already liquefied *kapha* in the body which is a prerequisite for *prameha* genesis. Thus these factors disturb the balance of the humours in the body which are sole keys for the origin of different types of *prameha*. This further clearly paves the idea that *pittaja* and *vatajaprameha* can be manifested in any type of patients surpassing the symptoms of *kaphajaprameha*. No doubt the body tissues and the humors should be favourable for the *prameha* but the display of *kaphajaprameha* symptoms in pittajaprameha patients is not mandatory.

***VYASANA*/ADDICTION AND *PRAMEHA*:**
There is an extensive body of literature reporting on the association between active cigarette smoking and the incidence of diabetes. Smoking also has a clinically significant effect on both oral and intravenous glucose tolerance tests that could influence diabetes detection.[22] This could be due to a direct effect of nicotine or other components of cigarette smoke on beta cells of the pancreas, as suggested by the association of cigarette smoking with chronic pancreatitis and pancreatic cancer.[23] In the classics smoking can be compared with *dhumpana* taken via adverse route. The continuous smoking causes vitiated of *pitta* in the body. *Raktadhatu* and *pitta* have homogeneity as both are made up of *agnimahabhuta*. The *drava* or liquid part of *pittadosha* is increased with causes the *raktadhatu* to overflow from the orifice and cause *raktapitta* and bleeding disorders. In *prameha* there is predominance of *jalamahabhuta*. The already *dravakapha* is responsible for *prameha* pathogenesis and consistent ill habit of smoking further causes vitiated *pittadosha* to increase *drava* part in the body. More and more *kleda* is formed and thus the gravity of pathogenesis is increased and *pittaja* types of *prameha* which are difficult to treat get manifested or there is increase in progression of *prameha* disease in the body involving other tissues.

ALCOHOL AND *PRAMEHA*: The ten *gunas* of *kapha*, which are essential in the pathogenesis of *prameha*, are *sveta, sheeta, murta, pichhila, accha, snigadha, guru, madhura, sandhra prasadha, manda.* The combination and permutation of these *gunas* are re-

sponsible for the formation of different types of *prameha*. The *pancha mahabhoutika* composition of these *gunas* can be equated with the ten *gunas* (attributes) of *ojas*.[24] While describing the harmful effects of alcohol, acharyas has described how the ten attributes of alcohol are able to curb down, vitiate the ten attributes of *ojas* in the heart, and give rise to mental distortions. Clearly, drinking large amounts of ethanol is to be avoided as such behaviour can cause ketoacidosis, hypertriglyceridemia, and if taken outside the context of a meal, can cause hypoglycaemia and ultimately increased death from no cardiovascular causes.[25]

GENDER AND *PRAMEHA*: In the global scenario, there is stronger effect of type 2 diabetes on the risk of CHD in women compared with men as in part explained by a heavier risk factor burden and a greater effect of blood pressure and atherogenic dyslipidaemia in diabetic women.[26]According to the classics, going by the principles the women probably have more vulnerability to get *prameha* disease. The *artavadhatu* is *agneya* in nature. In addition, *agneya* is homologous with *pittadosha* in the body. That means women have *pitta* predominance in the body, which is a trigger factor to liquefy already liquefied *kapha* responsible to cause *prameha*. When *pitta* is vitiated in the body in excess there is excess of *agneyaguna* and a tendency towards *somyaguna* intake which signifies *kapha* related *aaharvihara*. Also females are more prone to hold the natural urges like that of urine which is itself an etiological factor for causing *prameha*.[27] This is further justified by the social norms

pertaining at that time too.Concisely we can conclude that natural constitution of women is delicate and there were many myths, cultural restrictions for women during ancient times which made them vulnerable for this deadly disease.

PREDOMINANCE OF *RASA* INTAKE AND *PRAMEHA*: The relation between the *madhurarasa* intake was found to be most effective in causing *prameha* or in other words the most significant risk factor among all the type of *rasa* intake was *madhurarasa*. There are so many references in the classics that depict the strong relationship between *madhurarasa* and *kapha* predominance in the body. They are homogenous in nature being constituted from same *mahabhutajala* and *prithvi*. In the course of interaction between *rasa*s and *dosha*s inside the body, *dosha*s are aggravated by such of the *rasa*s which are entirely or considerably coordinated with them.[28] All the etiological factors described in *prameha* produce *kaphavardhaka* effect in the body.[29] Whether they are in form of food or lifestyle the final resultant is in form of *kapha* and *meda* predominance in the body. There is vivid description of general dietetic rules in the classics but it's the irony that these rules are not followed in todays scenario and fallouts are in form of diseases like *prameha* and other lifestyle disorders. The concept of *ativelam* (again and again) and *atipramanam* (in large quantity) elevates the aggravation of *kapha* in the body manifold times. The quantity of food taken in its entirety is *sarvagraha* and the quantity of each of its ingredients is *parigraha*. Neither of the two are followed as

per classics.[30]The proportion of *rasa* is to be determined according to the bodily constitution, season and dietetic property.[31] Neither of amongst all are monitored now a day that is why we have a pandemic of *prameha* / diabetes all over the globe.

AGE AND *PRAMEHA*: According to Ayurveda, age is divided into three childhood, middle and old. There is pronounced increase of *kapha, pitta* and *vayu* respectively in above ages described. The risk of disease increases in the middle age and old age respectively. By the age of 40 yrs there is fullness of all dhatus, sense organs, strength and power. As the age progresses there is debility of all the dhatus. The *prameha* patients' prognosis is better when the condition of the *dhatus* has not depleted i.e they are younger in age. According to studies done,[32] the prevalence of residual beta-cell function was almost 100 per cent during the first two years of disease and was lower thereafter in diabetics with early onset.

EXERCISE AND *PRAMEHA*: Sedentary habits (not exercising) and sleep which give pleasure are responsible for *prameha*. If they are unpleasant then they will not cause *prameha*.[33] The exercises done in moderation bring about bodily stability and strength.[34] The factors, which aggravate *kaphadosha* in the body, include not doing physical activities. Exercise plays a very imperative role in managing *prameha* as it brings lightness, ability to work, stability, resistance to discomfort and alleviation of *dosha*s (especially *kapha*).[35] It has a reducing effect on the body. The therapies which produce reducing effect cures stiffness, heaviness and coldness of the body.[36] Exercise stimulates and increases the *jatharagni*, which in turn increases the *dhatvagni*. The increased *agni* help in repairing the weakened metabolic activities in the body and assist the proper *dhatu* production in the body. Physical inactivity has been identified as a major determinant of type 2 diabetes, and increased activity has been shown to improve insulin sensitivity and glycaemic control among no diabetic individuals, as well as those with impaired glucose tolerance or overt type 2 diabetes.

BMI AND *PRAMEHA*: Body Mass Index (BMI) is a person's weight in kilograms divided by the square of height in meters.BMI has a positive correlation with obesity. In Ayurveda the obesity can be correlated with *sthaulya* disease. The symptoms of an obese and *sthaulya* patient are similar and more over the pathogenesis of both diseases are similar. In addition, there is a strong relationship with *sthaulya* and *prameha* disease. The excessive *meda* or fat is a prerequisite for the genesis of *prameha*. It is the common link between *sthaulya* and *prameha* disease. There is some change in the consistency of *meda* in *prameha* and *kapha* is not in liquid form unlike *prameha*. The World Health Organization has declared that obesity is a disease of pandemic significance, which threatens the developing world.1 Also alarming is that an estimated 80% of people with type 2 diabetes are obese at the time of diagnosis or have a history of obesity. The link between the two conditions is so strong that Shape up America trademarked the term diabesity.[37]

HYPERTENSION AND *PRAMEHA*: Mostly both the diseases occur together as there is a common metabolic pathway between the two. There is no direct reference to Hypertension in the classical texts of Ayurveda. Diabetes and hypertension frequently occur together. There is substantial overlap between diabetes and hypertension in aetiology and disease mechanisms. In hypertension the vitiated *Vata Dosha* is the main cause of the disease, as the *Dhatu Gati* (*Rasa Gati*) or *Vikshepa* is achieved by *Vayu* itself.[38] *Pitta* and *Kapha* complement the effect of vitiated *Vata* and support the progress of the disease with *Rasa, Rakta* (whole blood) being the main mediator of vitiation. This suggests the involvement of *Tridosha* in disease. *ManasaBhavas* like *Chinta*, *Krodha*, *Bhaya*, etc., play an important role in the pathogenesis, progression, and prognosis of disease. *Pitta* has many attributes and due to the liquid property of *pitta-dosha* which is vitiated in this disease, it pervades one *dhatu* after another. As a result of its heat more of the liquids exudate from these *dhatus*. These liquids get mixed up with *pitta* as a result of which *pitta* gets exceedingly aggravated or increased in property.[39] There is predominance of *jalamahabhuta* in the body. The similar condition prevails when a person is diseased with *prameha*. This is a favourable condition for the origin of *prameha*. There is impairment of *dhatu* metabolic pathway and there is excess of *jala mahabhuta* in the body due to specific type of *kapha* (excess in liquid) and *abadhha meda* (liquid form of fat). Hypertension adds more of the *jalamahabhuta* to already surplus conditions of it in the body. Thus, prevailing hypertension in the body is another risk factor for *prameha* patient.

Table 1: PRAMEHA RISK FACTORS AND THEIR SCORE ALLOTED

PARAMETERS	*PRAMEHA* SCORE GIVEN	AVERAGE EFFECT OF EACH PARAMETER
i) PRAKRITI (SHARIRA)		
Vata	1	
Pitta	1	
Kapha	1	
Vata-Pitta	2	
Pitta-kapha	2	
Vata-Kapha	2	
Kapha dominant	2	
		9.02%
ii) PRAKRITI (*MANASIKA*)		
Satvika	1	
Rajasika	3	
Tamasika	2	
Satvika- Rajasika	2	
Rajasika- Tamasika	3	
Satvika- Tamasika	1	

Satvika-Tamasika-Rajasika	1	
		5.74%
PREDOMINANCE OF *RASA* INTAKE		
Madhura rasa	3	
Amla rasa	2	
Lavana rasa	2	
Katu rasa	1	
Tikta rasa	1	
Kashaya	1	
		4.10%
VYAYAMA		
Pravar Exercise	1	
Madhyam Exercise	3	
Avar Exercise	2	
		4.92%
HYPERTENSION		
Systole BP <110	1	
Systole BP110-140	4	
Systole BP >140	1	
Diastole BP <70	1	
Diastole BP 70-90	4	
Diastole BP >90	1	
		9.84%
VAYA		
Bala< 16 Year	1	
Madhyam 17-30 Year	1	
30-45 Year	1	
46-60 Year	4	
Vriddha> 60 Year	2	
		7.38%
GENDER		
Male	2	
Female	4	
		4.92%
VYASANA(ADDICTION)		
Smoking	2	
Tobacco	1	
Tea Drinking	4	
Alcohol Drinking	1	
		6.56%
VIHARAJA NIDANA		
Aasyasukham	4	
Swapnasukham	3	
Aalasya	3	

Avyayam	3	
Achinta	3	
		9.84%
AAHARAJA NIDANA		
Vegetarian	3	
Non-Vegetarian	3	
2 times food (*atimatram*)	3	
3 times food (*atimatram*)	2	
4 times food (*atimatrama+ativelam*)	1	
		7.38%
MANASIKA NIDANA		
Krodh	2	
Shoka	2	
Bhaya	2	
Chinta	3	
Irsya	3	
		5.74%
STHAULYA(BMI)		
BMI: <18.5	1	
BMI: 18.5-25	2	
BMI: 25-30	2	
BMI: 30-35	1	
BMI: >35	1	
		5.74%
Total	122	

HOW TO USE PRE *PRAMEHA* RISK SCORE MODEL DESIGN

Evaluation of pharmacological action is based on the measurement of intrinsic (Maximum pharmacological action) activity, which is measured in form of EC50 or IC50. EC 50 is the effective concentration of drug in 50% population. Pharmacological actions are of two types. Useful actions (therapeutic actions) and un useful actions (side effects) or adverse drug reaction. From this evolutionary value, we take this concept in our study and we conclude that if the *prameha* score is 61 and more than the patient is in high-risk category. If less than 61 the patient is in low risk.

Table 2: PRE PRAMEHA RISK SCORE AND ITS INTERPRETATION

PRE *PRAMEHA* SCORE	INTERPRETATION
61 and more	High risk
Less than 61	Low risk

DISCUSSION

From the data analysed from the research projects referred for the present study it can com-

prehended that the risk factors for *Prameha* can be categorized as modifiable and un modi-fiable parameters which are listed as below

Table 3: Modifiable and Un modifiable Risk Factors in *Prameha*

MODIFIABLE PARAMETERS	UN MODIFIABLE PARAMETERS
Predominance of *Rasa* intake	Family history
Sthaulya/BMI	*Prakriti- Sharirika*
Hypertension	*Prakriti- Manasika*
Smoking, Drinking	*Vaya*
ManasNidana	Gender
Aahar Nidana	
Vihara Nidana	
Vyayama	

The above table shows the list of some of the risk factors that can be divided into two categories. The factors, which are modifiable, fall in the perimeter of the physicians that can be intervened. Therefore, the factors in the first column are actually the real culprits and hold a lion's share in causing the risk of *prameha*. From **Table No. 1** the percentage of relevant factor with respect to the study has been given. The *sharirika prakriti* is 9.02%, *manasika prakriti* is 5.74%, predominance of *rasa* intake is 4.10%, *vyayama* is 4.92%, hypertension is 9.84%, *vaya* is 7.38%, *vyasana* is 6.56%, *viharaja nidana* is 9.84%, *aaharaja nidana* is 7.38%, *manasika nidana* is 5.74%, and *sthaulya* is 5.74% out of 100%. For *prameha* a classic screening or preventive strategy can begin from here with principles of primordial prevention by application of this tool. The predominance of *rasa* intake, *viharaja nidana*, *aaharaja nidana*, *manasika nidana*, *sthaulya* and *vayayam* are.79/2 some of the factors that can be intervened in the form of future studies.

CONCLUSION

The above parameters like *rasa* intake, *viharaja nidana, aaharaja nidana, manasika nidana, sthaulya* and *vayayam* can be directed as the main parameters to be dealt with in regards to *prameha* disease. Also the Pre *Prameha* Risk Score refer score card can be referred by various departments of the institute to predetermine the *prameha* in the patients.

Limitations and Scope of Future Studies:

- The data collected from the previous researches to develop Pre *Prameha* Score could have been better utilized if the non *prameha* subjects data was also available. Due to its absence it was very difficult to find out the real risk factors behind this disease. The result is an estimated calculation and not an exact one. Under the addiction column, tea drinking the percentage of tea drinkers relevant to the *prameha* disease was 3.68%, even more than smokers which was 1.37%. This shows that tea drinking has maximum causal effect in causing *prameha* but in reality, it is not. On the contrary the smokers are more prone to get diabetes in future as per the global researches. It is because the prevalence of diabetes with smoking is more than the non smoking population. The data

of non smokers is essential in calculating the above risk factor. Whereas in the present study the data of non *prameha* subjects was missing.

- The Pre *Prameha* Risk Score was developed on the basis of Indian Diabetes Risk Score developed by Dr. V Mohan. This was initially the first attempt of doing the same. It can be further modified, edited as per the basic principles of Ayurveda and statistical methods. Due to absence of proper data, certain methods like ROC curve could not prepared. It is proposed for the future studies to validate it.

- The above application tool can be further validated by its usage in other studies.

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