



## **A Cross Sectional Clinical Analysis of Hemiplegia (Pakkavatham) Related to Diabetes Mellitus (Mathumeham) and Hypertension (Erathakothippu)**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author KS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author AM corrected the protocol, managed the analyses of the study and corrected the final manuscript. Author AR supervised this research study. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Background:** Stroke (*Pakkavatham*) is the second leading mortality cause in global and death occurrence rates, rising in middle to older aged people. This condition is increased due to the dietary pattern and lifestyle modifications.

**Aim:** To determine about the interrelationship of Type II Diabetes Mellitus (DM) and Systemic Hypertension (SHT) associated with hemiplegia.

**Study Design:** Cross Sectional Descriptive Observational Study.

**Place and Duration of Study:** This study work was carried out in 50 patients in Government Siddha Medical College and Hospital, Palayamkottai, Tirunelveli, Tamil Nadu from April 2019 to September 2019.

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**Materials and Methods:** This study was carried in 50 subjects (30 subjects in Out Patient Department (OPD) and 20 subjects in In Patient Department (IPD) were randomly selected and the data were collected by interviewing with a structured questionnaire. The ethical clearance was attained from the Institutional Ethical Committee.

**Results:** The highest incidence was male patients (38%) than female patients, the affected age group was 51-60 years. The prevalence was seen in male alcoholic consumers (46%), chronic smokers (44%) respectively. The incidence was mostly seen in hypertensive (70%) and non-diabetic (46%) male patients. Among the 50 patients, 14 patients (28%) had both SHT and DM. The most prevalence was seen in hypertensive patients than DM or SHT combined with DM patients. The moderate improvement was seen in the patients (32%) of control blood pressure and serum glucose level.

**Conclusion:** The SHT may influence in the prevalence of *Pakkavatham* and control blood pressure and serum glucose level may be improved the good prognosis in *Pakkavatham* patients.

**Keywords:** *Pakkavatham; Hemiplegia; Type II diabetes mellitus; Mathumeham; Systemic Hypertension; Erathakothippu.*

## 1. INTRODUCTION

The *Pakkavatham* (Hemiplegia) is a most dangerous disease in the world, especially in developing countries like India and becoming a raised morbid or mortality ratio and disability [1,2,3,4,5]. The Global Burden of Diseases study revealed nearly 5.87 million people were affected in stroke related deaths occurred in 2010 [6,4]. It was compared with 1990 statement (4.66 million) was increased by 1.2 million people were affected by stroke [7,8]. The past two decades 26% increased in stroke related deaths. The mortality of stroke is occurred 20 - 30% in the 1<sup>st</sup> month and 60% of survivors are dependent [9,8].

In Siddha system of medicine *Pakkavatham* is one among the type of eighty *Vatha* diseases [10,11,12,13]. In *Yugimuni Vaithiya Chinthamani* 800 is defined, it is a condition with exaggeration of *Vatham* was combined other anyone of the two humour (*Pitham* or *Kabham*) which spreads all over the body and produced paralyzed the one half of the body, excessive sweating and paleness of the body. The many Siddha literatures described that ingestion of *Vatha* vitiated foods, excessive intake of alcohol and toddy, angry, *Meganoi* and *Thamaraganoi* are the main predisposing causes for *Pakkavatham* [9,10,3]. "*Pakkavayu*" "*Paarisa vaayu*", "*Paksha vaayu*", "*Paarisa vatham*" and "*Paksha vatham*" are the similar names of "*Pakka vatham*". "*Pakka vatham*" is called as "*Pakshaghata*" in Ayurveda, and "*Falij*" in Unani [10,11,12,13].

The many prospective studies concluded, stroke topography outcome in diabetes and

hypertension separately [2,9]. This study was carried by questionnaire in 50 patients with known acute stroke and positive history of diabetes and systemic hypertension. The study was to prospectively illustrate hemiplegia in the diabetic and hypertensive patients at Government Siddha Medical College and Hospital, Palayamkottai, Tirunelveli and to evaluate the prognosis in hemiplegic patients with diabetes and systemic hypertension.

## 2. AIM

To find out the prognosis about *Pakkavatham* (Hemiplegia) and assess the interrelationship between SHT and T2DM associated with *Pakkavatham*.

## 3. LITERATURE REVIEW

The siddha text *Yugimuni Vaithiya Chinthamani* 800, *Pakkavatham* occurs due to vitiated *vatha dhosa* which spreads all over the body, which can produce paralysis the one half of the body, with or without facial involvement, excessive sweating and paleness of the skin colour [14,11,12,13]. *Mathumeham* comes under *Meganoi* and *Erathakothippu* comes under *Pitha Noi* which affects the heart [6,11,12,13]. The *ayurvedha* system is renamed by *Pakka vatham* is called as *Pakshaghata* and named *Falij* is called in Unani system of medicine. The *Silethumavatham Naadi* (Pulse) can be felt and observed in all *Pakkavatham* cases [10,11,12, 13].

## 4. MATERIALS AND METHODS

- Study population - The patients who attending with the history of *Pakkavatham*

in Out Patient Department and In Patient Department of Government Siddha Medical College & Hospital, Palayamkottai during the period of April 2019 to September 2019.

- Study design – A Cross Sectional Descriptive Observational Study.
- Study period - Six months from April 2019 - September 2019.
- Sampling method – Random clinical trial
- Sample size - 30 subjects in OPD and 20 subjects in IPD were selected by Random Clinical Trial (RCT) in Out Patients Department (OPD) and Indoor Patient Department (IPD) at Govt. Siddha Medical College, Palayamkottai.
- Study procedure.
  - Data were collected from patients / guardians attending to OPD and IPD at Government Siddha Medical College and Hospital, Palayamkottai by interviewing with a structured questionnaire.
  - Laboratory investigations were done in sterile circumstances.
  - After obtaining the written consent of the patient (through the consent form in their understandable language) they were enrolled in the study.
  - All the data which were collected via questionnaire, had entered and analyzed

with the simple statistical method. The collected literature review was evaluated with the results.

## 5. RESULTS AND DISCUSSION

The highest incidence of *Pakkavatham* was observed in 51-60 aged group of male patients. Among the 50 patients 06 male patients (12%) and a female patient (02%) were affected in 31-40 aged group, 09 male patients (18%) and 03 female patients (06%) were affected in 41-50 aged group, 19 male patients (38%) and 07 female patients (14%) were affected in 51-60 aged group and 04 male patients (08%) and a female patient (02%) was affected by *Pakkavatham* in 61-70 age group.

The highest incidence of *Pakkavatham* was observed in alcoholic male patients. Among the 50 patients 23 male patients (46%) were consumed alcohol. 15 male patients (30%) and 12 female patients (24%) were not consumed alcohol.

The highest incidence of *Pakkavatham* was observed in smoking male patients. Among the 50 patients 22 male patients (44%) were chronic smokers. 16 male patients (32%) and 12 female patients (24%) were non smokers.

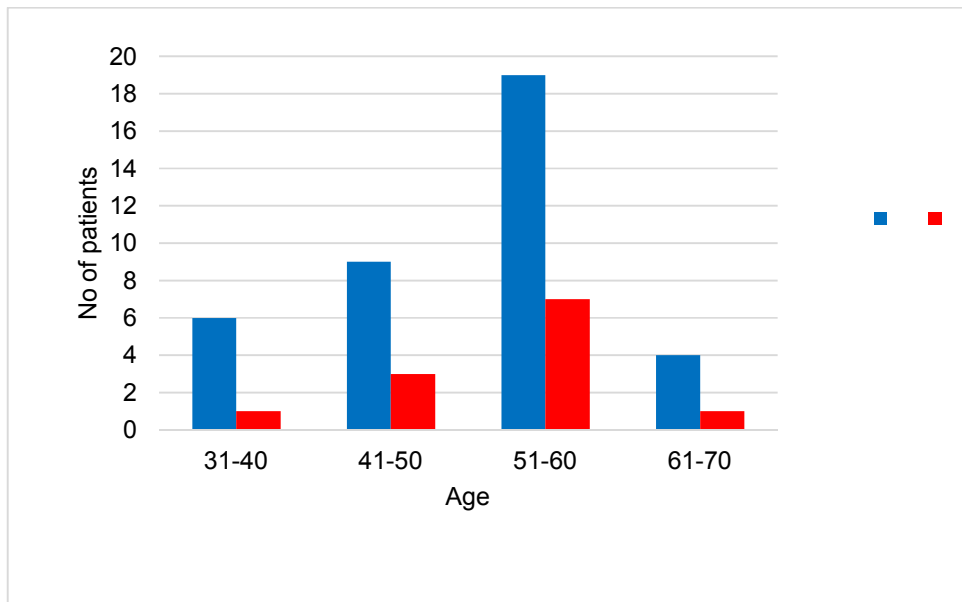


Fig. 1. Distribution of *Pakkavatham* in relation to the age

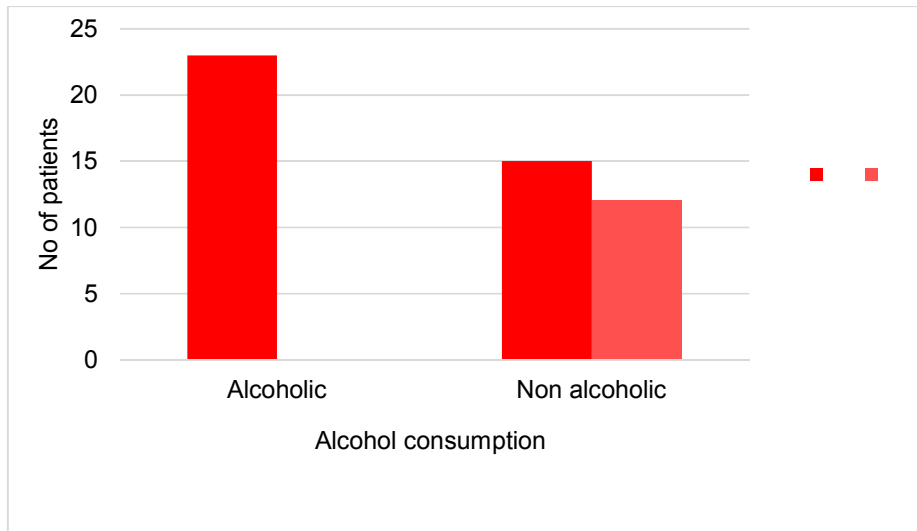


Fig. 2. Distribution of *Pakkavatham* in relation to the alcohol consumption

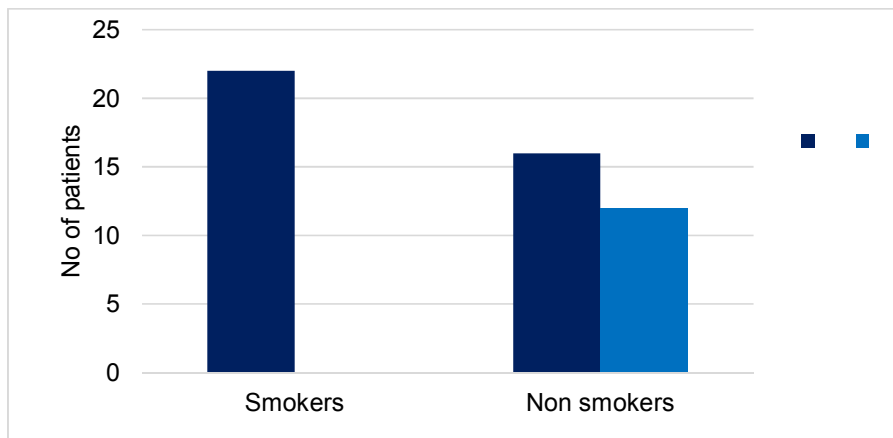


Fig. 3. Distribution of *Pakkavatham* in relation to the smoking

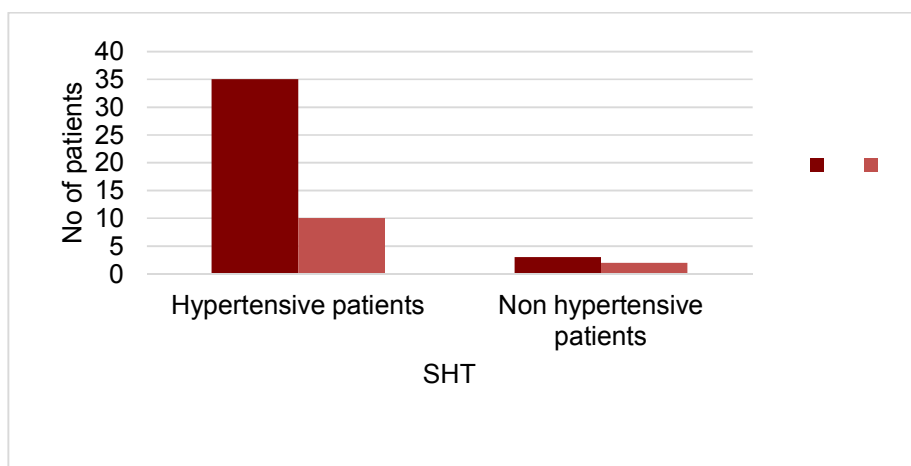


Fig. 4. Distribution of *Pakkavatham* in relation to the SHT

The highest incidence of *Pakkavatham* was observed in hypertensive male patients. Among the 50 patients 35 male patients (70%) and 10 female patients (20%) had SHT. 03 male patients (06%) and 02 female patients (04%) were non hypertensive patients.

The highest incidence of *Pakkavatham* was observed in non DM male patients. Among the 50 patients 15 male patients (30%) and 04 female patients (08%) had DM. 23 male patients (46%) and 08 female patients (16%) were non DM patients.

The highest incidence of *Pakkavatham* was observed in male patients with affected of limbs in right side. All the 50 patients were affected on one side of both upper and lower limbs. Among the 50 patients 22 male patients (44%) and 05 female patients (10%) were affected in right side.

16 male patients (32%) and 07 female patients (14%) were affected in left side.

The highest incidence of *Pakkavatham* was observed in male patients due to haemorrhage. Among the 50 patients 33 male patients (66%) and 11 female patients (22%) were developed with *Pakkavatham* due to haemorrhage. 02 male patients (04%) and 01 female patient (02%) were developed due to infarction, 03 male patients (06%) were developed due to accident.

The Fig. 8 was shown the significant control of blood pressure among the 50 patients.

The Fig. 9 was shown the significant control of serum glucose among the 50 patients.

Among the 50 patients, 14 patients had SHT and DM. Among 14 patients 01 male and female

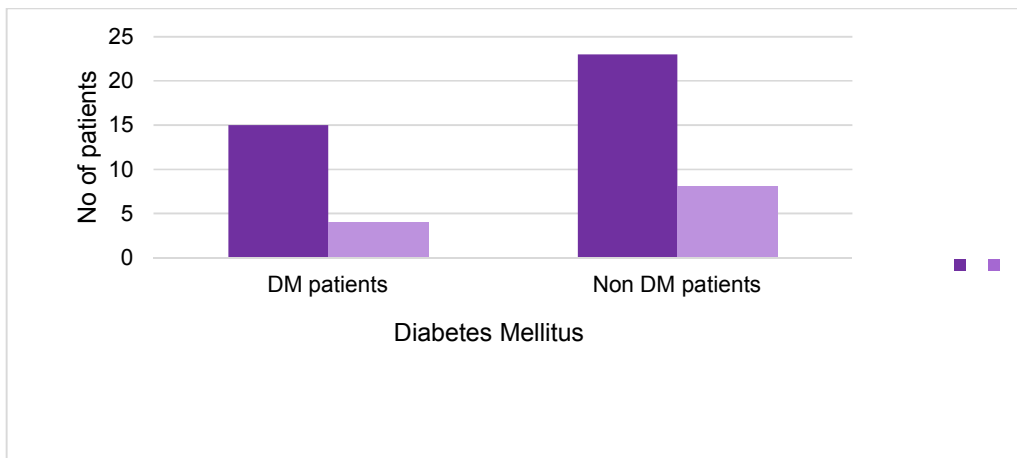


Fig. 5. Distribution of *Pakkavatham* in relation to the DM

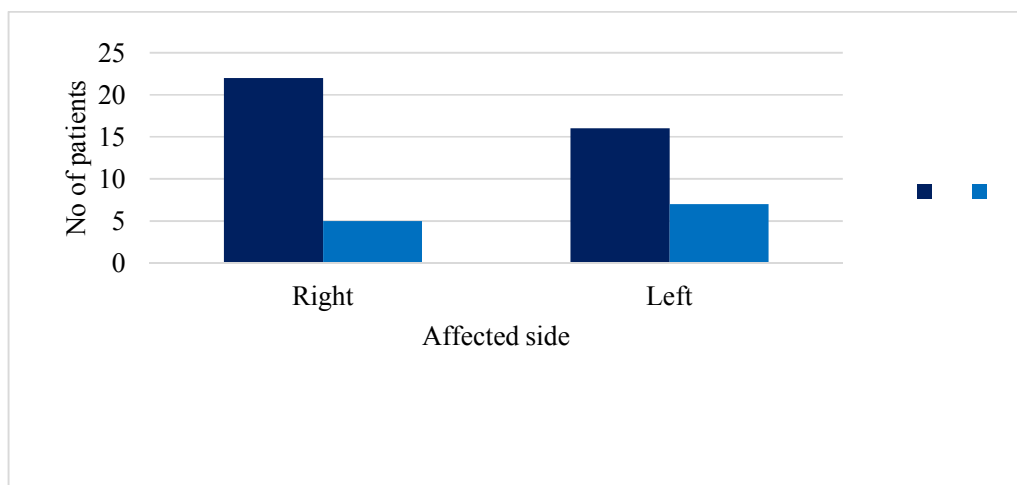
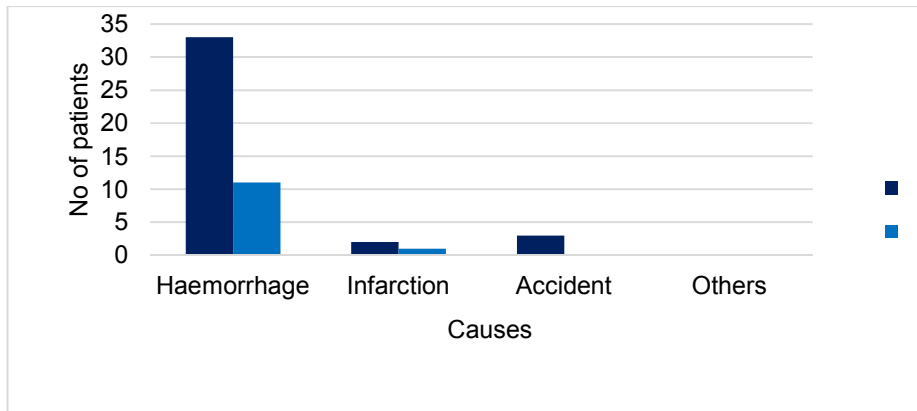
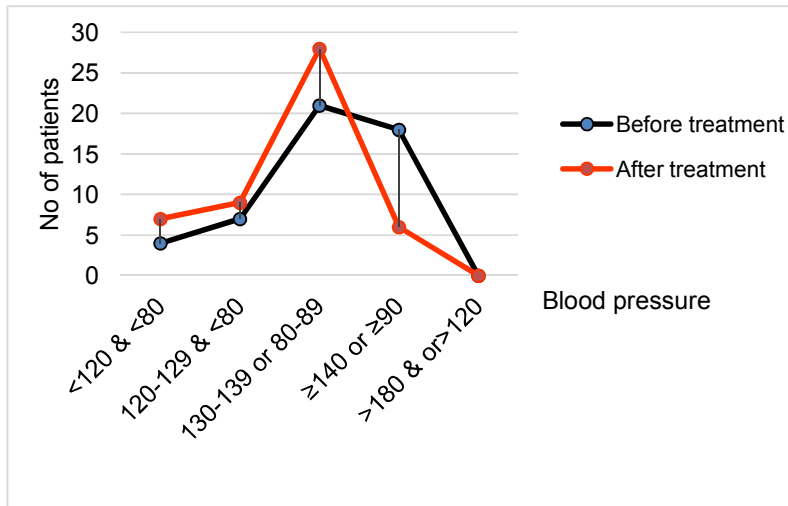


Fig. 6. Distribution of *Pakkavatham* in relation to the affected side

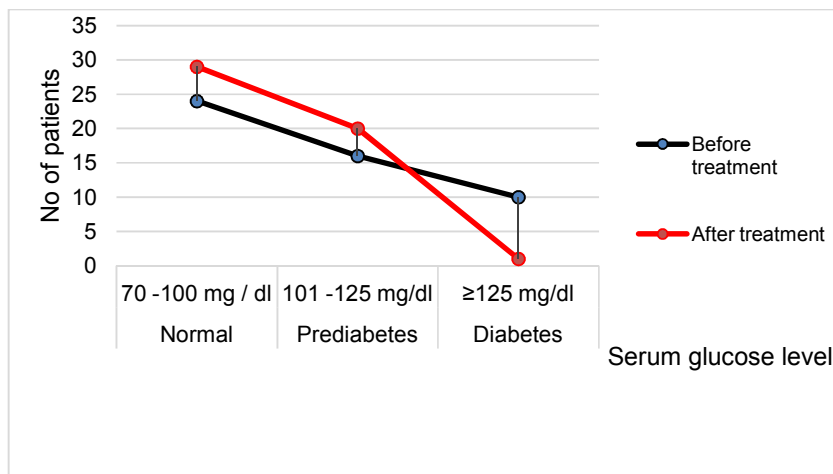


**Fig. 7. Distribution of Pakkavatham in relation to the causes**

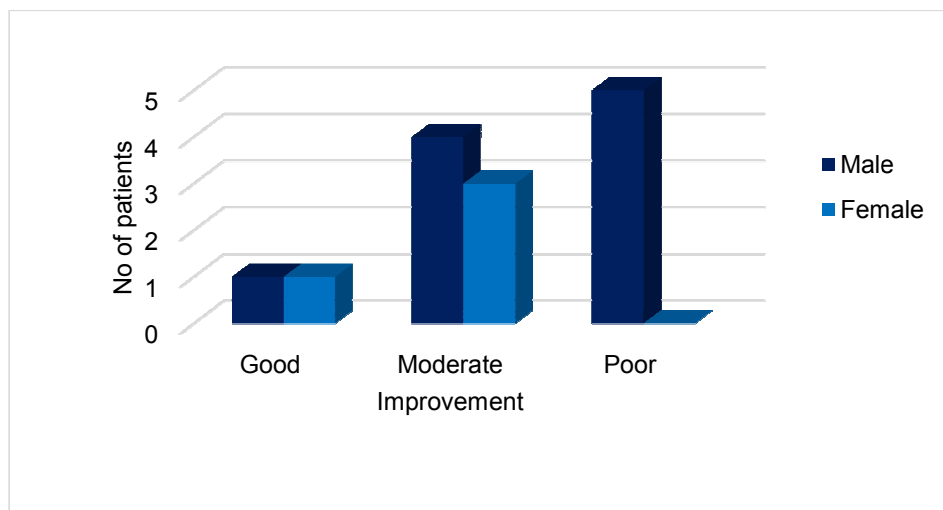
patients (7.14%) had good improvement, 04 (21.42%) had moderate improvement and 09 male patients (28.56%) and 03 female patients (64.28%) had poor improvement.



**Fig. 8. Status of blood pressure before and after treatment**



**Fig. 9. Status of serum glucose before and after treatment**



**Fig. 10. Distribution of Pakkavatham in relation to the improvement**

## 6. CONCLUSION

The *Pakkavatham* (Hemiplegia) is one of the most threaten disease in around the world. *Pakkavatham* occurs due to the vitiated and dominated *Vatha dhosa*. The highest incidence of *Pakkavatham* was observed in 51-60 aged group of male patients (38%). Among the 50 patients is the highest occurrence was seen in 16 male sedentary working patients (34.02%) from middle income grouped (34%). Both genders of *Pakkavatham* patients of more than 24 to 29 of BMI were mostly affected. The prevalence was seen in male patients of alcoholic consumers (46%), chronic smokers (44%) and non-betel chewers (50%). From this study, the most prevalence was seen in hypertension associated with T2DM patients. The moderate improvement was seen in the patients of control blood pressure and serum glucose level.

## CONSENT AND ETHICAL APPROVAL

The written informed consent was obtained from selected subjects before commencement of the study. The ethical clearance was obtained from the Institutional Ethical Committee (IEC) before the minor project is initiated. The patient was allowed to withdraw from interviewing if he/she is not satisfied with this study along with ensuring the continuation of required treatment procedures. The laboratory investigations were conducted with free of charge. Laboratory investigations were done with full consent of the subjects and the subject were released from the study if the subjects dislike to involving in any investigation. Sterile circumstance was

maintained in the laboratory investigation procedures. The data collected from the patient were kept strictly confidential.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Gray CS, Taylor R, French JM, Alberti KG, Venables GS, James OF, et al. The prognostic value of stress hyperglycaemia and previous unrecognized diabetes in acute stroke. *Diabetic Medicine*. 1987;4: 237-40.

2. Jorgensen H, Nakayama H, Raaschou HO, Olsen TS. Stroke in patients with diabetes - The Copenhagen Stroke study. *Journal of the American Heart Association*. 1994;25:1977-1984. DOI: 10.1161/01.STR. 25.10.1977
3. Pulsinelli WA, Levy DE, Sigsbee B, Scherer P, Plum F. Increased damage after ischemic stroke in patients with hyperglycemia with or without established diabetes mellitus. *American Journal of Medicine*. 1983;(74):540-544.
4. Report of the WHO task force on stroke and other cerebrovascular disorders: Stroke: Recommendations on stroke prevention, diagnosis and therapy. *Stroke*. 1989;20:1407-1431.
5. Weir CJ, Murray GD, Dyker AG, Lees KR. Is. Hyperglycaemia an independent predictor of poor outcome after acute stroke? Results of a long term follow up study. *Bio Medical Journal*. 1997;314(3):1303-1306.
6. Kamalakannan S, Gudlavalleti ASV, Gudlavalleti VSM, Goenka S, Kuper H. Incidence & prevalence of stroke in India: A systematic review. *Journal of Medical Research*. 2017;146(2):175-185.
7. Mohr JP, Rubenstein L, Edelstein SZ. Approaches to pathophysiology of stroke through the NINCDS data bank. In: Plum F, Pulsinelli W, eds. *Cerebrovascular diseases, fourteenth research (Princeton-Williamsburg) conference*. New York: Raven Press. 1985;63-8.
8. Sylaja PN, Pandian JD, Kaul S, Srivastava MVP, Khurana D, Schwamm LD, Kesav P, Deepti A. Ischemic stroke profile, risk factors, and outcomes in India. The Indo-US Collaborative Stroke Project. *Journal of American Stroke Association*. 2018;219-222.
9. Kiers L, Davis SM, Larkins R, Hopper J, Tress B, Rossiter SC, Carlin J, Ratnaik S. Stroke topography and outcome in relation to hyperglycemia and diabetes. *J Neurol Neurosurg Psych*. 1992;55:263-270.
10. Noinadal noimuthal nadal thiraddu, Sanmugavelu M, *Indian Medicine and Homeopathy*, Chennai 600 106. 2016; 426-429.
11. Siddha Maruthuvam (Pothu), Kupusamy Muthaliyar KN. *Indian Medicine and Homeopathy*, Chennai 600 106, 2004;588.
12. Yugimuni Vaithiya Chinthamani 800. Mohan RC, Thamarai Library, Vadapazhani, Chennai. 2013;104-105. verse 274, 275.
13. Yugimuni Vaithiya Chinthamani Perunool 800. Thiyagarajan R, Siddha literatures publication group, Chennai – 26. 1976;203.
14. Sarabendra Vaidhya Muraikal- Vatha roga Chikitchai, Vasudeva Sasthiri K, Saraswathy Mahal Library, Thanchavoor. 1998;Pxxxv,verse 276.

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