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Memory enhancement activity of herbomineral formulation Thanga uram

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Abstract

Siddha medicine is one of the most ancient medical systems of India. Siddha is the mother medicine of ancient Tamils/Dravidians of peninsular South India. This system has enormous pharmacopoeia containing vegetable, animal and mineral products.**Objective**: To evaluate the memory enhancement activity of THANGA URAM (TU) *in Wister* albino rats by Diazepam induced method.**Material and mathods**: The animals were randomly selected and divided into five groups (I,II, III ,IV and V) of six rats(n=6) each. Individual identification of the animal was made by marking. Group I animals served as control and received only honey, p.o. for 7 days. *Group II* served as standard drug was treated with Piracitam (200mg/kg/day)i.p once a day, for 7days. Experimental groups splits into group III and IV served as the treated groups and received TU which was grounded in mortar-pestle with honey. *Group III* was treated with 23mg/kg of TU orally once for 7days. . *Group* IV was treated with 46mg/kg of TU orally once for7days.**Result:** Time taken to reach the reward chamber (TRC) on the eighth day (24h after last dose) reflected the memory of animals. Significant reduction in TRC value indicated improvement in memory. TU with honey (23mg/kg, p.o.) did not show any significant effect on TRC compared with the control group of young rats.

Keywords: thanga uram, cognitive, siddha, piracetam ,memory

Introduction

Siddha System of Medicine is a complete reputed medical system that has been practiced in India. Its origin dates back to BC 10,000 to BC 4,000[1] . The name Siddha medicine owes its origin to medicinal ideas and practices of a class of Tamil sages called the Siddhars-"Perfected" or "Holy immortals who are still believed to have superhuman powers. Siddha medicine is the only medicine which bestows longevity. The word Siddha comes from the word 'Siddhi' which means an object to attain perfection or heavenlybliss.

Dementia is a syndrome of gradual onset and continuing decline of higher cognitive functioning. It is a common disorder in older

persons and becomes more prevalent in each decade of life . Approximately 10% of adults 65 years and older and 50% of adults older than 90 years have dementia . The most common cause of dementia is Alzheimer disease, which is a progressive neurodegenerative disorder associated with loss of neurons in distinct brain areas . The central cholinergic pathways play a prominent role in memory processes . Centrally acting antimuscarinic drugs (e.g., scopolamine) impair memory in animals and human beings . Currently, the allopathic system of medicine principally relies on nootropic agents such as piracetam, aniracetam, fosracetam, nefiracetam, and so forth, and anticholinesterases such as donepezil, metrifonate, rivastigmine, and so forth (Ringman & Cummings

Thanga uram is one of the Herbo mineral formulation mentioned in classical siddha text Gunapadam Thathu Jeeva Vaguppu indicated particularly for all male and female urogenital (janana urupugal) diseases. It also used to treat naatpatta vellai (chronic leucorrhoea) and megam (venereal diseases). It also improves appetite, memory power and strengthens the body. It also improves spermatogenesis (1).

Materials and Methods

Ingredients of test drug: -

Purified Navacharam (Ammonichloridum) – 35gms
Purified Velvangam(Stannum) –35gms
Purified Kandhagam (Sulphur) – 35gms
Purified Rasam(Hydragyrum) – 35gms
Vediupputhiraavagam – Sufficient quantity forgrinding

Method of preparation:[2]

Purified **Navacharam (**Chloride of aluminium), Purified **Velvangam** (stannum), Purified **Kandhagam** (sulphur), and Purified **Rasam (**mercury) are taken in equal quantities and titurated with vediuppu thiravagam upto mezhugu (wax) consistency. They are then placed in glass container and sealed with mud packed cloth and burnt in valuga appliance for 25 hours and the appliance is left undisturbed to get cooled. Now the prepared medicine shines like gold particles and abragam.

Procurement and rearing of experimental animal:

Adult male Wistar rats weighing 180-210 gms were used for this study. The inbred animals were procured from the animal house of TANUVAS, Madhavaram, Chennai and the study was conducted at National Institute of Siddha, Chennai, India. They were housed six per cage under standard laboratory conditions at a room temperature at 22 ± 2^0 C. The animals were subjected under standard photoperiodic condition of 12:12 hrs light:dark cycle. The animals were fed with standard rodent pellet procured from Sai meera foods Pvt Ltd, Bangalore and water ad libitum. Animals were acclimatized to laboratory conditions one week prior to initiation of experiments.The protocol for experimentation was approved by Institutional Animal Ethics Committee (IAEC Approval No: NIS/IAEC-VII/28/08/2018/03) of National Institute of siddha, Chennai,India

Table no:1 Animal grouping and interventions

Groups	Intervention	No of Rats
GrouI-VehicleControl	Honey	**6**
Group II – Diazepam induced group	Diazepam (1mg /kg/day)	**6**
Group III –Treatment group 1	TU (23mg / kg / day) with honey +(inj.diazepam 1mg / kg /b.w/ day)	**6**
Group IV – Treatment group 2	TU (46mg/ kg / day) with honey +(inj.diazepam 1mg / kg /b.w/ day)	**6**
Group V-Standard drug group	Piracetam 200mg/kg	**6**

Animal grouping and interventions:

The animals were randomly selected and divided into five groups (I,II, III ,IV and V) of six rats(n=6) each. Individual identification of the animal was made by marking. Group I animals served as control and received only honey, p.o. for 7 days. *Group II* served as Diazepam induced group (Diazepam) , received Diazepam (1mg /kg/day). Experimental groups splits into group III and IV served as the treated groups and received TU which was grounded in mortar-pestle with honey. *Group III* was treated with Diazepam (1mg /kg/day) along with 23mg/kg of TU orally once for 7days. . *Group* IV was treated with Diazepam (1mg /kg/day) along with 46mg/kg of TU orally once for 7days Administration was done once a day by oral gavage in themorning.

Drug treatment:

In the current investigation, the rats were divided into 5 different groups for employing various interoceptive and exteroceptive memory models. Each group comprised a minimum of six animals. TU with honey (23, 46mg/kg) was administered orally for 7 successive days to young and aged rats. Ninety-minutes after the administration of the last dose (on the seventh day), rats were exposed to the training session using HebbWilliams maze. Retention (memory) was recorded after 24h (on the eighth day). Amnesia was induced in separate groups (interoceptive models) of young rats diazepam (1mg/kg, i.p.) 90min after the last dose of extract with honey (23, 46,/kg, p.o.) administration on the seventh day. The animals were exposed to the training session(on the seventh day) 45min after diazepam injection. The retention (memory) was measured after 24h (on the eighth day). Piracetam (200mg/kg, i.p.) was used as an established nootropic agent and was injected for 7 days to positive control groups. All control group animals received vehicle (honey) for 7 consecutive days

Hebb-Williams maze:

Hebb-Williams maze is an incentive-based exteroceptive behavioral model useful for measuring spatial working memory of rats[2] . It mainly consists of three components: animal chamber (or start box), which is attached to the middle chamber (or exploratory area), and a reward chamber at the other end of the maze in which the reward (food) is kept. All three components are provided with guillotine removable doors. On the first day (i.e., seventh day of drug treatment), the rat was placed in the animal chamber or start box and the door was opened to facilitate the entry of the animal into the next chamber. The door of the start box was closed immediately after the animal moved into the next chamber to prevent back-entry. Time taken by the animal to reach the reward chamber from the start box was recorded on the first day (training session) for each animal. Each animal was allowed to explore the maze for 3min with all the doors opened before returning to its home cage. Retention of this learned task (memory) was examined 24h after the first day trial (i.e., eighth day, 24h after lastdose).[3]

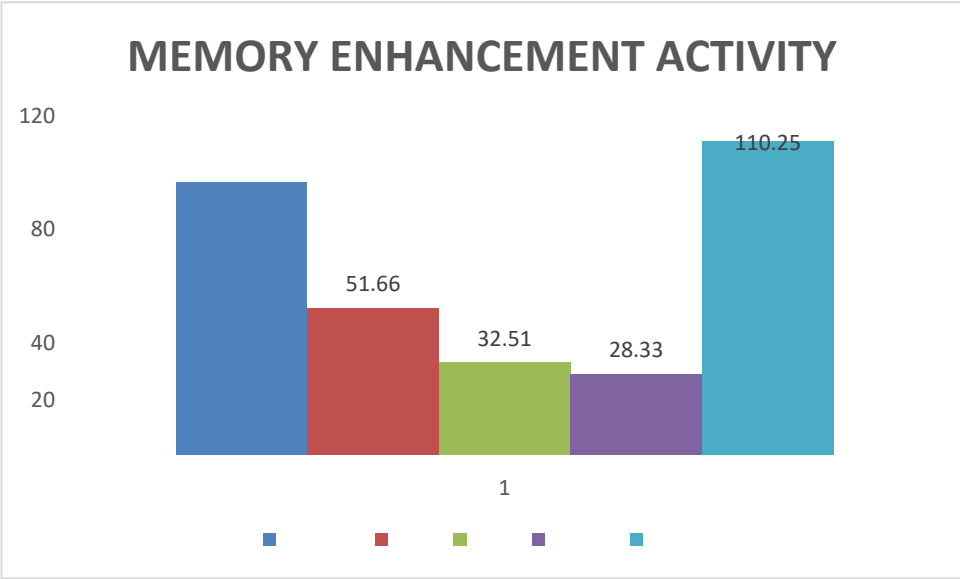
Table no:2 Effect of THANGA URAM on memory enhancement activity:

Groups	Intervention	TRC
Group I [Vehicle Control]	Honey	95.83± 103.21
Group II[Diazepam induced group]	Diazepam (0.1ml /kg/day)	110.25± 8.16
Group III[Treatmrnt Group-1]	TU (23mg / kg / day) with honey +(inj.diazepam 1mg / kg /b.w/ day)	51.66± 6.83
Group IV[Treatment Group-2]	TU (46mg / kg b.w / day) with honey + (inj.diazepam 1mg / kg /b.w/ day)	32.51± 5.24
Group I[Standard drug]	Piracetam 200mg/kg	28.33± 5.16

TRC-Time taken to reach the reward chamber
Values are expressed as mean ± SEM; n=6; *followed by Dunnett test.*

Effect Of Memory Enhancement Activity

Chart 5: Effect of memory enhancement activity



Effect on time taken to reach reward chamber (using Hebb-Williams maze): Time taken to reach the reward chamber (TRC) on the eighth day (24h after last dose) reflected the memory of animals. Significant reduction in TRC value indicated improvement in memory. TU with honey (23mg/kg, p.o.) did not show any significant effect on TRC compared with the vehicle control group of young rats. On the other hand, the higher doses of 46mg/kg TU with honey administered orally in young rats for 7 days markedly reduced TRC compared with the respective control groups. diazepam (1mg/kg, i.p.) significantly increased TRC compared with the vehicle control group of young rats, indicating impairment of memory (amnesia).

TU administered for 7 days reversed the amnesia induced by diazepam. The groups of rats that were treated with piracetam (200mg/kg, i.p.) for 7 successive days showed improvement in memory of young rats. Piracetam also reversed amnesia induced bydiazepam.

Discussion

Memory refers to the storage, retention, and recall of information including past experiences, knowledge, and thoughts . Drugs that enhance acquisition and recall of associative memory represent important goals in the therapy of cognitive disorders. In the current study, *Thanga uram*. administered orally for 7 days improved the memory of rats as reflected by diminished TL and TRC values compared with those of control animals. Furthermore, pretreatment with TPE for 7 days protected the animals from memory deficits induced by intraperitoneal injection of scopolamine or diazepam, in addition to ageing-induced amnesia (a natural process). Piracetam, the established nootropic agent, was used as a standard drug.

Conclusion

Lateral border of the scapula terminates superiorly at glenoid cavity (GC) which articulates with the head of the humerus to form gleno-humeral joint.[1] The articular surface of GC is pear shaped, with its inferior half being 20% larger than the superior half.[2]

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