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EVALUATION O F ANTI-PARKINSONS ACTIVITY OF *CARICA PAPAYA* USING ALBINO RATS

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ABSTRACT
Herbal medicines include a range of pharmacologically active compound in some cases it is not well understood which ingredients are important for a therapeutic effect. In comparison, many therapeutic herbs have far fewer side effects. They can provide alternative treatment or be used to enhance the effect of prescription medications. Papaya scientifically known as *Carica Papaya* (Caricaceae) is a good source of vitamins A, B and G and an excellent source of vitamin C (ascorbicacid) which exhibits anti-oxidant, anti-inflammatory, anti-sickling activity in addition to its many other benefits. Different concentrations of papaya juice (4%, 8% & 16%) were treated among them at a dose of 16% exhibited significant reduction in catalepsy time when compared to control.

KEYWORDS: Parkinsonism, catalepsy, haloperidol.

1.1 INTRODUCTION

Herbal medicines include a range of pharmacologically active compound in some cases it is not well understood which ingredients are important for a therapeutic effect. The supporters of herbal medicine believe that isolated ingredients in the majority of cases have weaker clinical effects than whole plant extract, a claim that would obviously require proof in each case. Although a multitude of pharmaceutical agents are available for the treatment of mental disorders, physicians find that many patients cannot tolerate the side effects, do not respond adequately, or eventually lose their response. In comparison, many therapeutic herbs have far fewer side effects. They can provide alternative treatment or be used to enhance the effect of prescription medications.

Parkinsonism (also known as Parkinson's syndrome, atypical Parkinson's, or secondary Parkinson's) is a neurological syndrome characterized by tremor, hypokinesia, rigidity and postural instability.[1] Parkinsonism shares symptoms found in Parkinson's disease, from which it is named; but Parkinsonism is a symptom complex[2, 3] and differs from Parkinson disease which is a progressive neurodegenerative illness. The underlying causes of Parkinsonism are numerous and diagnosis can be complex. The neurodegenerative condition Parkinson's disease (PD) is the most common cause of Parkinsonism. However, a wide range of other etiologies may lead to a similar set of symptoms, including some toxins, a few metabolic diseases and a handful of neurological conditions other than Parkinson's.[4]

About 7% of people with Parkinsonism have developed their symptoms following treatment with particular medications. Side effect of medications, mainly neuroleptic antipsychotics especially the phenothiazines (such as perphenazine and chlorpromazine), thioxanthenes (such as flupenthixol and zuclopenthixol) and butyrophenones (such as haloperidol (Haldol), piperazines (such as ziprasidone) and, rarely, antidepressants. The incidence of drug-induced Parkinsonism increases with age. Drug induced Parkinsonism tends to remain at its presenting level, i.e. does not progress like the parkinson diseases.[5]

The efficacy of medicines for the treatment of Parkinson is limited. Therefore herbal therapies should be considered as alternative medicines.

MATERIALS AND METHODS

Requirements

Gloves, Face Mask, Tuberculin syringe (1ml)-2, Beaker-50ml Magnetic stirrer/Sonicator & Oral feeding needle.

Chemicals/Drugs/Reagents

Syndopa (levodopa & carbidopa) 150mg/kg & Haloperidol -1mg/kg. The solvents used are Distilled Water, saline. Other reagents used were of laboratory grade and obtained from various other commercial

sources. All the reagents used were of laboratory and analytical grade.

Animals

Albino rats (male) weighing 150-200gm were used for animal studies. The animals were grouped in Polyacrylic cages and maintained under standard laboratory conditions (Temp 27 ± 2°C) and relative humidity (50 ± 5%) with dark and light cycle (14/10 hrs). The rats were acclimitized to laboratory conditions for 10 days before commencement of experiment. The experiment was carried out according to the (CPCSEA) guidelines and Institutional Animal Ethical Committee (IAEC) approved all procedures.

Selection of Dose and Standard Drug Preparation of *Carica Papaya* Fruit Juice

Different odoses in the concentrations of 4%, 8%, 16%, of fresh juice of papaya juice administered orally for a duration of 6 days.[6] Levodopa was used as the reference drug for evaluating the anti parkinsonian activity. Levodopa suspension was prepared using saline.

Experimental Design

On the day of the experiment, the animals were divided randomly into control and experimental groups (n=6). Group 1 received the vehicle, saline (1ml/kg) and served as the control group, group 2, 3 and 4 received the test drugs in the doses of 4%, 8%, 16% p.o and group 5 received the standard drug Levodopa (1mg/kg) i.p. Drugs/vehicle was administered to the animals 60 minutes prior to the behavioural evaluation. The anti-parkinsonian activity of test drug was evaluated using haloperidol induced catalepsy model.

Haloperidol induced catalepsy

Catalepsy was measured by means of standard bar test. In this method, interior paws of rats were placed over a 9 cm high standard wooden bar and time course of retention of rats in this imposed posture was considered as a bar test elapsed time. The end point of catalepsy was considered to occur when both front paws were removed from the bar or if the animal moved its head in an exploratory paradigm. A cut-off time of 180 seconds was applied. All observations were carried out by an observer that was unaware from entity of treatment.

Treatment Schedule of *Carica Papaya*

S.No	Group	Treatment	Purpose
1	Control	Saline+haloperidol(1mg/kg)	Serves as a control
2	Standard	Levodopa(1150mg/kg)+ haloperidol(1mg/kg)	Serves as standard
3	Test-1	Fresh juice of papaya(4%)+haloperidol(1mg/kg)	To assess antiparkinsonism of papaya juice
4	Test-2	Fresh juice of papaya(8%)+haloperidol(1mg/kg)	To assess antiparkinsonism of papaya juice
5	Test-3	Fresh juice of papaya(16%)+haloperidol(1mg/kg)	To assess antiparkinsonism of papaya juice

Statistical Analysis

The mean±S.E.M. values were calculated for each group. The data were analysed using student t test. $P<0.001$ was considered to be statistically significant.

EXPERIMENTAL RESULTS

Evaluation of Antiparkinsonian Activity Using Fresh Juice of Papaya

Neurological Catalepsy Test

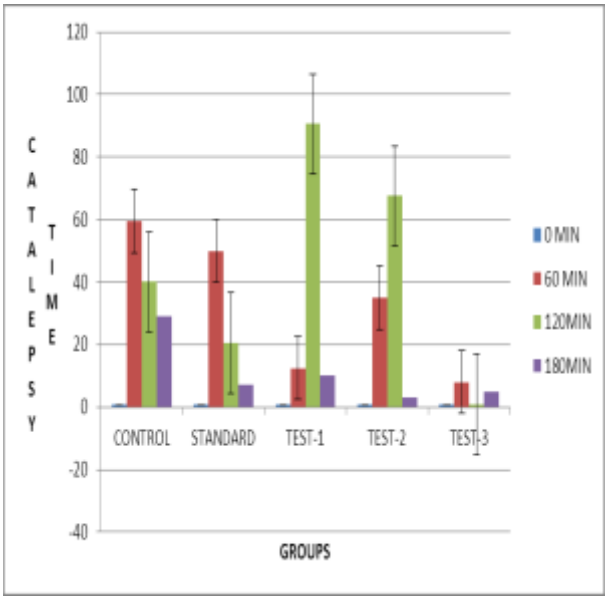
It was observed that the fresh juice of papaya at a dose of 16% exhibited significant reduction in catalepsy time when compared to control in dose dependent manner. Similarly the animals treated with levodopa (150mg/kg) as expected showed significant decrease in catalepsy time.

Effect of *Carica Papaya* Juice on Duration of Catalepsy Time

S.No	Group	Treatment	CATALEPSY TIME			
			0 MIN	60 MIN	120 MIN	180 MIN
1	Control	Saline	0.8±0.34	59.5±4.51	40±5.25	29±1.26
2	Standard	Levodopa (150mg/kg i.p.)	0.8±0.34	50±3.81	20.5±3.41	7±0.37
3	Test-1	4% of Papaya juice (2ml/200gm orally)	0.8±0.34	12.5±5.03	90.6±4.0	10±4.18**
4	Test-2	8% of papaya juice (2ml/200gm orally)	0.8±0.34	3.5±1.01	67.5±2.87	3±0.79
5	Test-3	16% of papaya juice (2ml/200gm orally)	0.8±0.34	8±0.79	0.8±0.34	5±0.18***

Values are expressed as mean ± S.E.M. (n=6), in each group **p < 0.01, ***p < o.oo1 when compared to control.

EFFECT OF *CARICA PAPAYA* JUICE ON CATALEPSY TIME



Values are expressed as mean ± S.E.M. (n=6), in each group **p < 0.01, ***p < o.oo1 when compared to control.

DISCUSSION

The treatment with haloperidol often because distressing side effect involving the extra-pyramidal tract these adverse reactions comprise of variety of movement disorders, including drug induced Parkinsonism.[7] This occurs in 20-40% of the patient population. The chronic use of haloperidol sometimes leads to irreversiable extra pyramidal disturbances such as tardive dyskinaesia. Similar disorders are reproducible in normal monkeys who are treated for many months with haloperidol and so, these symptoms are n merely an interaction between the psychotic state and the drug effects are largely due to the drug alone.

In the present study we evaluated the effect of papaya juice on haloperidol induced catalepsy which is an accepeted model of parkinsons disease and demonstrated that the agent has a significant antiparkinsonian action.

CONCLUSION

The present results suggest that fresh juice of *carica papaya* produces the anti-parkinsonian like effect as it decreases the catalepsy time during haloperidol induced catalepsy. It was found to be similar to that of levodopa. The papaya juice at a concentration of 16% was found to be more potent when compared to 4% & 8%. The anti-parkinsonian effect of papaya juice may be because of increasing dopamine and antagonism of NMDA. However further studies are required to determine the exact mechanism involved in the anti-parkinsonian effect of *carica papaya.*

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