



SCREENING FOR HYPOGLYCEMIC AND ANXIOLYTIC ACTIVITY ON THE LEAF EXTRACT OF *NERIUM ODORUM* IN EXPERIMENTAL ANIMALS

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KEYWORDS :

INTRODUCTION:

Diabetes is a disease that occurs when your blood glucose, is too high. Blood glucose is your main source of energy and comes from the food you eat. Insulin, a hormone made by the pancreas, helps to maintain the blood glucose levels in body. Sometimes body doesn't make enough insulin or doesn't use insulin well. Glucose then stays in blood and doesn't reach to cells. Over time, having too much glucose in blood can cause health problems. Although diabetes has no cure, can take steps to manage diabetes and stay healthy. Sometimes people call diabetes "a touch of sugar" or "borderline diabetes." These terms suggest that someone doesn't really have diabetes or has a less serious case, but every case of diabetes is serious. Most symptoms of diabetes are increased urine output, excessive thirst, weight loss, hunger, fatigue, male sexual dysfunction, skin problems, slow healing wounds, yeast infections, and tingling or numbness in the feet or toes. Diabetes screening tests are Random blood glucose test, Urine glucose test, Fasting plasma glucose test, HbA1c test, Oral glucose tolerance test. Oral drugs are available for the diabetes.

Anxiety is a general term for several disorders that cause nervousness, fear, apprehension, and worrying. The American Psychological Association (APA) defines anxiety as "an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure." A rush of adrenaline in response to danger causes these reactions. This adrenaline boost is known as the 'fight-or-flight' response. It prepares humans to physically confront or flee threats to safety. Most symptoms of anxiety is trembling and sweating, Nausea and dizziness, Chest pain and headaches, Weakness in the limbs and muscle tension. Generally anxiety disorders are treated with psychotherapy, medication, or both

PLANT NAME:

- **Scientific name or Botanical name:**
- Nerium oleander L.
- **Family:** Apocynaceae (oleander family).
- **SYNONYM⁶⁵:** Telugu: Kastooripatte, Errugumeru, Ganneru

Chemical constituents: Flavanoids, tannins, saponins and carbohydrates.

FLAVANOIDS: They are found in onions, leeks, Brussels sprouts, kale, broccoli, tea, berries, beans and apples. There are three primary types of flavanols: monomers (more widely known as catechins), dimers, polymers, teas, cocoa, grapes, apples, berries, fava beans and red wine. Main functions of flavonoids are chemical messengers, physiological regulators, and cell cycle inhibitors. And health benefits are Anti viral, Anti cancer, Anti diabetic, Anti anxiety and Anti inflammatory.

AIM & OBJECTIVE:

The literature reveals that anxiolytic & hypoglycemic activity on *Nerium odorum* has not been reported. In view of this, leaves of *Nerium odorum* has selected for anxiolytic & hypoglycemic activity on experimental animals.

The present study is therefore plan with the following objective

1. Extraction of *Nerium odorum* leaves with decoction process.
2. Preliminary photochemical screening of crude extract.
3. Toxicity study.
4. Evaluation of aqueous extract of *Nerium odorum* leaves for its anxiolytic & hypoglycemic activity by following models-

Parameters to study

Anxiolytic model:

- Elevated plus maze model.

Hypoglycemic model:

- Estimation of fasting blood glucose level in
- Oral glucose tolerance test in normal rats,

METHODOLOGY:

The leaves were dried in shade at room temperature. The dried leaves were coarsely powdered, stored in airtight container until used. Extraction of leaves of *Nerium Odorum* was carried out by decoction process. Albino wister rats (200-250 gm) were used throughout the experiment for the purpose of acute toxicity. Here mainly two types of methods are used. Those are ORAL GLUCOSE TOLERANCE TEST (OGTT) & ELEVATED PLUS MAZE models are used for the oral hypoglycemics and anxiolytic activity respectively. Here Standard drugs are Glibenclamide (2 mg/kg) for hypoglycemic and diazepam (2 mg/kg) for anxiolytic activity. Dose of extraction was 250 mg and 500 mg. Excellent results are exhibited at 500 mg dose in both conditions.

RESULTS:

Preparation of Extract

Extraction of leaves of *Nerium Odorum* was carried out by using decoction.

Table No.2 The percentage yield of extracts

| Sl. No. | Extract | Grams | Percentage yield |
|---------|---------|--------|------------------|
| 1. | Water | 500gms | 32% |

Preliminary Phytochemical testing of *Nerium Odorum* leaves extracts:

The investigation of the preliminary phytochemical qualitative examination of aqueous extracts of *Nerium Odorum* shows the presence of different constituents in Table. 2

Table No.3 Preliminary Phytochemical testing of *Nerium Odorum* leaves extracts:

| Chemical Test | Aqueous extract |
|--|-----------------|
| Tests for saponin a. Foam test | + |
| Tests for Alkaloids Hager's test | + |
| Tests for carbohydrates Molisch's test | + |
| Tests for Flavonoides (a) Shinoda test (b) Ferric chloride test | + |
| (c) Lead acetate test (d) Sulphuric acid test | + |
| Tests for Tannins Ferric chloride test | + |

'+' = Present

5.3 Determination of acute toxicity.

Aqueous, extracts of *Nerium Odorum leaves* were studied for acute toxicity at doses of 5mg/kg, 50mg/kg, 250mg/kg,500mg/kg, and 2000mg/kg as per OECD 420 guideline .Dose of 2000mg/kg showed the toxic symptoms, so according to OECD guideline 420, it is considered as a LD₅₀ cutoff value. Doses selected for pharmacological studies by fixed dose methods are mentioned below:

- Aqueous extract -250 mg/kg (1/8th of 2000mg/kg)
- Aqueous extract -500 mg/kg (1/4th of 2000mg/kg)

HYPOGLYCEMIC ACTIVITY

Oral glucose tolerance test:-

OGTT means the body's ability to use a type of sugar, called glucose , that is the body's main source of energy. OGTT, a test of immense value and sentiment.

In the present study, the hypoglycemic activity of crude extracts of *Nerium Odorum leaves* was evaluated against of glucose load in normal rats .The results showed that aqueous, extracts increase the glucose tolerance in normal rats,

OGTT on normal rats:

The effect of the aqueous, extracts of the *Nerium Odorum leaves* on glucose tolerance test in normal fasted rats was shown in table.No.03 and fig.No.01.

Most significant reduction was observed for aqueous extract 500 mg/kg on 120 minute (65.67mg/dl) compared to the normal group. It also showed marked significant decrease in 30, 60 minute respectively compared to the control group (89,84mg/dl).

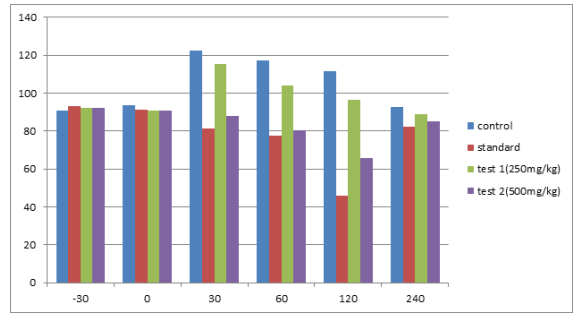
Glibenclamide showed its potent hypoglycemic activity and is bring back the increased glucose to normal level compared to the normal group,

At time 120 minute (46mg/dl). It reduced the elevated blood glucose level at 30, 60 minute after the administration of glucose significantly compared to the normal control group

Table No. 4 Effect of *Nerium Odorum* leaves extracts on oral glucose tolerance test in normal rats

| Groups | Treatment | Blood glucose level mg/dL (Mins) | | | | | |
|-------------|----------------------|----------------------------------|-------|--------|--------|--------|-------|
| | | -30 | 0 | 30 | 60 | 120 | 240 |
| Control-I | Distilled water | 90.66 | 93.58 | 122.65 | 117.25 | 111.39 | 92.64 |
| Standard-II | 2mg/kg Glibenclamide | 93.33 | 91.28 | 81.36 | 77.32 | 46 | 82.45 |
| Aqueous-III | 250mg/kg | 92.4 | 90.87 | 115.26 | 103.8 | 96.54 | 88.65 |
| Aqueous-IV | 500mg/kg | 92 | 90.54 | 87.9 | 80.53 | 65.67 | 85.23 |

Fig.No. : 21 Effect of *Nerium Odorum* leaves extracts on blood oral glucose tolerance test in normal rats



ANTI-ANXIETY ACTIVITY

Elevated plus maze test:

5.4.1 Aqueous extracts of NO on EPM:

The effect of the aqueous, extracts of the *Nerium Odorum leaves* on elevated plus maze was shown in table.No. and fig.No.

Time spent in open arm

Most significant reduction was observed for aqueous extract 500 mg/kg (23.13sec) compared to the normal group.

Most significant reduction was observed for diazepam 2 mg/kg (50.345sec) compared to the normal group.

Entries in open arm

Most significant reduction was observed for aqueous extract 500 mg/kg (2) compared to the normal group.

Most significant reduction was observed for diazepam 2 mg/kg (4.5) compared to the normal group.

Table No.5 Effects of aqueous extracts of NO from elevated plus maze test in rats.

| Treatment | Time spent in open arm | No. of entries in open arm |
|--------------------|------------------------|----------------------------|
| Control | 9 | 0.5 |
| Diazepam (2 mg/kg) | 50.345 | 4.5 |
| AENO1 (250 mg/kg) | 9.21 | 1.1 |
| AENO 2 (500 mg/kg) | 23.13 | 2 |

Fig.No.22 Effect of *Nerium Odorum* leaves extracts on time spent in open arm

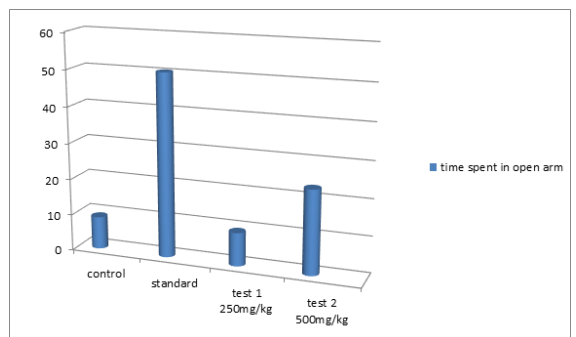


Fig.No.23 Effect of *Nerium Odorum* leaves extracts on number of entries in open arm

CONCLUSION:

The study was to evaluate the hypoglycemic effect of *Nerium Odorum leaves* by using behavioural animal models of hypoglycemic. The major finding of present investigation proposes the hypoglycemic activity on Oral Glucose Tolerance Test (OGTT) in rats. Glibenclamide shows its mechanism by activating GLUT 2 transporter in beta cells(pancreas). Aqueous extract of 500mg/kg exhibited maximum tolerance of glucose at 120 minute significantly as compared to the control group. Standard glibenclamide (2 mg/kg) exhibited maximum tolerance of glucose at 120 minutes(46mg/dL) as compared to the control group. The aqueous extract of *Nerium Odorum leaves* may be similar effect like sulfonyl ureas.

The study was to evaluate the anxiolytic effect of aqueous extract of *Nerium Odorum* leaves by using behavioural animal models of anxiety. The major finding of present investigation proposes the anxiolytic activity on elevated plus maze test in rats. Diazepam increases the percentage of entries and the time spent in the open arm confirms its anxiolytic effects.

The aqueous extract dose 500 mg/kg shows increase average time spent in open arm as compare to control. The aqueous extract dose 500 mg/kg shows decrease average time spent in open arm as compared to standard drug diazepam 2 mg/kg. 250 mg/kg of aqueous extract did not alter the above parameter significantly it does not exhibit anxiolytic activity. Phytoconstituent like flavonoids were reported for their anxiolytic activity.

Further studies are needed to isolate and characterize the active components responsible for the hypoglycemic and anxiolytic property of the test extracts.

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