DETERMINATION OF ANTI-INFLAMMATORY AND CNS DEPRESSANT ACTIVITIES OF 1-(1-(PYRIDIN-2-YL)ETHYLIDENE)THIOUREA

Dr. G. Valli*, P. Mareeswari* & M. Murugalakshmi*

*Department of chemistry, S.F.R College for women, Sivakasi, Tamil Nadu, India.
Address for communication: Dr. G. Valli, Associate Professor & Head
Department of Chemistry, S.F.R College for women, Sivakasi Virudhunagar District Tamilnadu India
E-mail : mrs.valliravichandran@gmail.com

ABSTRACT
The Schiff base (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea was prepared from 2-acetylpyridine and thiourea by microwave oven method using standard procedure. Anti-inflammatory and CNS activities of (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea were studied using albino rats of both the sexes. Animals were divided into four groups, each consisting of four animals. Group 1 served as control and Group 2 received standard drug. Group 3 received 200mg/kg of (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea and Group 4 received 400mg/kg of (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea. For the determination of anti-inflammatory activity, inflammation was induced using 1% Carrageenan. CNS depressant activity of the compound was measured by placing the rat individually in the Locomotor for 15min. The results obtained showed that the Schiff base was found to exhibit anti-inflammatory and CNS activities. The Anti-inflammatory activity determination showed that (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea 200 mg/kg as well as 400mg/kg were found to exhibit higher anti-inflammatory activity (42.4% and 46.5%) as that of standard diclofenac sodium (31.5%) after 30 minutes. The CNS depressant activity of (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea (400mg/kg) exhibited closer CNS depressant activity (74.10%) as that of standard chlorpromazine (74.55%).

KEYWORDS: 2-acetylpyridine, thiourea, anti-inflammatory and CNS depressant

INTRODUCTION
Various literature reviews the importance of Schiff bases¹. The Schiff bases play a vital role and find its use in analytical chemistry, agriculture, dyes and polymer industries besides their utility as model systems in the field of bio-inorganic chemistry.² Schiff bases are the important compound owing to their wide range of biological activities and industrial application. They have been found to possess the...
pharmacological activities such as antimalarial, anticancer, antibacterial, antifungal, antitubercular, anti-inflammatory, analgesic, antiviral and CNS depressant etc. They also serve as a back bone for the synthesis of various heterocyclic compounds. In view of these above biological importance of Schiff base, We plan to synthesis \((E)-1-(1-(pyridin-2-yl)ethylidene)thiourea\) by standard procedure. The present work focus on the synthesis of the Schiff base by green synthesis from 2-acetylpyridine and thiourea in ethanol for thirty seconds. The pharmacological activities like anti-inflammatory and CNS depressant activities were studied.

MATERIALS AND METHODS

Materials used

The chemical such as 2-acetylpyridine, thiourea of E.merck grade and distilled ethanol were used.

Drugs

Diclofenac sodium (standard for anti-inflammatory) and Chlorpromazine (standard for CNS) were chosen for our work.

Animals used

For the anti-inflammatory and CNS depressant activity studies twenty four albino rates of both sexes of weight 100-165g were used for each studies.

Methods used

Preparation of Schiff base

The Schiff base was prepared as given in Scheme 1. The 2-acetylpyridine and thiourea were taken in an equimolar ratio of 0.005mol in ethanol (5ml). The reaction mixture was placed on microwave oven for thirty second. The product was isolated and crystallized from absolute ethanol. The yield and the melting point were noted.

DETERMINATION OF ANTI-INFLAMMATORY ACTIVITY\(^{12-13}\)

Carrageenan induced paw edema

Carrageenan-induced hind paw edema is the standard experimental model of acute inflammation. The animals were divided into four groups as Control, Standard, group 3 (200mg/kg) and group 4 (400mg/kg) of the Schiff base. Acute inflammation was produced by sub plantar injection of 0.1 ml of 1% suspension of carrageenan in normal Saline, in the right hind paw of the rats, one hour after oral administration of the drugs. The paw diameter was measured with the aid of a vernier caliper at 0, 15, 30 and 60mts after the injection of carrageenan. The difference between the readings at time zero minutes and the different time intervals were taken as the thickness of edema. With Diclofenac sodium (5mg/kg) as standard, group 3 and group 4 were treated orally with \((E)-1-(1-(pyridin-2-yl)ethylidene)\) thiourea of 200 and 400 mg/kg dose levels of drugs by feeding needle and the paw diameter were measured at 0, 15, 30 and 60mts after the injection of the standard, \((E)-1-(1-(pyridin-2-yl)ethylidene)\) thiourea and the recorded values were given in Table-I. Percentage inhibition of paw edema is calculated by comparing the controls. The percentage inhibition of inflammation was calculated for each dose at different hours as given below.

\[
\text{Percentage inhibition} = \frac{1 - V_t}{V_c} \times 100
\]
Where Vt = volume of paw edema in treated animals
Vc = volume of paw edema in control animals

DETERMINATION OF CNS DEPRESSANT ACTIVITY

CNS depressant activity was recorded by Locomotor method. Locomotor activity was recorded with a using a digital activity cage (Actophotometer). The animals were divided into four groups (n = 4). Each rat was individually placed in the actophotometer for 10 minutes. Animals of group 1 was treated orally with Caffeine (30 mg/kg) (p.o.), group 2 was intraperitoneally treated with Chlorpromazine 3 mg/kg (i.p.). Group3 and group 4 were treated orally with (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea of 200 mg/kg & 400 mg/kg dose levels of drugs.

Basal reaction time was noted before and 30 minutes after the administration of treatment. A count was recorded when the beam of light falling on the photocell of actophotometer was cut off by rat group 2 received reference standard Chlorpromazine at a dose of 3 mg/kg (i.p.) 30 minutes before the test. Mean change in the locomotor activity was recorded for each group. The recorded values were listed in Table-II

RESULT AND DISCUSSION

Anti-inflammatory activity

The anti-inflammatory activity determination showed that dose dependent increase in the size of the edema range from 0.121±0.02 to 0.055±0.0155 for Standard Diclofenac Sodium 10mg/kg and from 0.098±0.0175 to 0.020±0.007 for 200mg/kg and 0.095±0.035 to 0.045±0.0185 for 400mg/kg of (E)-1-(1-(pyridin-2-yl)ethylidene) thiourea. The result showed that both 200mg/kg & 400mg/kg of this compound after thirty minutes exhibited higher anti-inflammatory activities as 42.4% and 46.5% respectively.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose</th>
<th>Mean time (in second) ± SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15mts</td>
<td>30mts</td>
</tr>
<tr>
<td>Control</td>
<td>Saline 5 mg/kg</td>
<td>0.143±0.017</td>
</tr>
<tr>
<td>Standard</td>
<td>Diclofenac Sodium 10mg/kg</td>
<td>0.121±0.02 (15.3%)</td>
</tr>
<tr>
<td>Schiff base</td>
<td>200 mg/kg</td>
<td>0.098±0.0175 (31.4%)</td>
</tr>
<tr>
<td>Schiff base</td>
<td>400 mg/kg</td>
<td>0.095±0.035 (33.5%)</td>
</tr>
</tbody>
</table>

CNS depressant activity

The results obtained for the dose dependent depression in the locomotor activity was 21.25 ± 2.462 for standard chlorpromazine. For 200 mg/kg of (E)-1-(1-(pyridin-2-yl)ethylidene) thiourea was 18±3.2405 and 42.75±1.436 for 400mg/kg of this compound. 200mg/kg of the drug exhibited similar CNS depressant activity as that standard chlorpromazine.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose</th>
<th>Locomotor activity(score in 10 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment % change</td>
</tr>
</tbody>
</table>

Table-I

Anti-inflammatory activity of (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea

Table-II

Locomotor activity of (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea
Available online on www.ijarpb.com

<table>
<thead>
<tr>
<th></th>
<th>Activity</th>
<th>Standard Chlorpromazine</th>
<th>CNS Depressant Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caffeine 30 mg/kg(p.o.)</td>
<td>106.0±1.472</td>
<td>205.0±2.972</td>
<td>93.39</td>
</tr>
<tr>
<td>Chlorpromazine 3 mg/kg (i.p.)</td>
<td>83.5±0.6455</td>
<td>21.25±2.462</td>
<td>74.55</td>
</tr>
<tr>
<td>Schiff base 200 mg/kg p.o</td>
<td>69.5±1.9365</td>
<td>18±3.2405</td>
<td>74.10</td>
</tr>
<tr>
<td>Schiff base 400 mg/kg p.o</td>
<td>121.75±2.0155</td>
<td>42.75±1.436</td>
<td>64.88</td>
</tr>
</tbody>
</table>

CONCLUSION

The Schiff base (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea was prepared from 2-acetylpyridine and thiourea exhibited anti-inflammatory and CNS depressant activities. When compared to standard diclofenac sodium (31.5%), both 200 mg/kg & 400 mg/kg of the (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea exhibited higher (42.4% & 46.5%) anti-inflammatory activities after thirty minutes of drug administration.

The dose dependant depression in the locomotor activity was measured for caffeine, chlorpromazine, 200 and 400 mg/kg of (E)-1-(1-(pyridin-2-yl)ethylidene)thiourea 200 mg/kg of this Schiff base have shown approximately closer CNS depressant activity (74.10%) when compared to standard chlorpromazine (74.55%).

References