METFORMIN LIKE ANALGESIC AND ANTIDEPRESSANT ACTIVITIES OF A TURMERIC EXTRACT ENRICHED IN CURCUMINOIDS

SURUCHI VERMA
Ph.D. Research Scholar

Neuropharmacology Research Laboratory
Department of Pharmaceutics
Indian Institute of Technology (Banaras Hindu University)
Varanasi, India
Email: suruchi.verma.rs.phe13@iitbhu.ac.in
INTRODUCTION

POPULATION

70%

30%

Use Traditional medicine

TURMERIC
OBJECTIVES

• To compare the single and repeated daily oral doses of a turmeric extract containing 95.4% curcuminoids (CLE) with metformin in hot plate test.

• To estimate the effect of CLE with metformin on stress responses in mice.
Figure 1: HPLC chromatogram of curcuminoids enriched *Curcuma longa* extract.
Methods

• In this exploratory experiment, the effect of test agents were quantified in three well standardized pharmacological models described in the following:

  ➢ Hot plate test
  ➢ Stress induced hyperthermia test
  ➢ Tail suspension test
PROTOCOL

1. Basal rectal temperature and Body weight was measured

2. Drug Treatment

3. Plasma glucose, insulin, cortisol estimation

4. Tail Suspension Test

5. Stress Induced Hyperthermia

6. Hot Plate Test

7. PROTOCOL
Statistical Analysis

• The data are expressed as Mean±SEM and $p<0.05$ was considered statistically significant.

• One way ANOVA followed by Student-Newman-Keuls multiple comparison test

• Two way ANOVA followed by Bonferroni post hoc test.

• GraphPad Prism-5 was used for statistical analysis.

• Origin-Pro 8 software was used for graphical representation.
RESULTS

Figure 2: Hot plate reaction time of male mice treated with curcuminoids enriched turmeric extract (CLE) and metformin (MET).
Figure 3: Thermal stimuli induced hyperthermia in male mice treated with curcuminoids enriched turmeric extract (CLE) and metformin (MET).
Figure 4: Effect of thermal stimuli induced stress on body weight of male mice treated with curcuminoids enriched turmeric extract (CLE) and metformin (MET).
Figure 5: Body weight difference of male mice treated with curcuminoids enriched turmeric extract (CLE) and metformin (MET).
Figure 6: Effect of thermal stimuli induced stress on basal rectal temperature in male mice treated with curcuminoids enriched turmeric extract (CLE) and metformin (MET).
**Table 1**: Effect of curcuminoids enriched turmeric extract (CLE) and metformin (MET) on stress induced hyperthermia in male mice on day 11.

<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>Rectal Temperature (°C)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Before</td>
<td>After</td>
<td>Difference</td>
</tr>
<tr>
<td><strong>CMC-1</strong></td>
<td></td>
<td>37.60±0.09</td>
<td>38.32±0.07&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.72±0.04</td>
</tr>
<tr>
<td><strong>CMC-2</strong></td>
<td></td>
<td>37.42±0.15</td>
<td>38.08±0.16&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.67±0.03</td>
</tr>
<tr>
<td>CLE (5 mg/kg)</td>
<td></td>
<td>37.18±0.11</td>
<td>37.82±0.11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.63±0.06</td>
</tr>
<tr>
<td>CLE (20 mg/kg)</td>
<td></td>
<td>36.87±0.15</td>
<td>37.43±0.13&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.57±0.03</td>
</tr>
<tr>
<td>CLE (80 mg/kg)</td>
<td></td>
<td>36.88±0.09</td>
<td>37.42±0.08&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.53±0.05</td>
</tr>
<tr>
<td>MET (50 mg/kg)</td>
<td></td>
<td>36.85±0.09</td>
<td>37.45±0.12&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.60±0.06</td>
</tr>
</tbody>
</table>
Figure 7: Effect of curcuminoids enriched turmeric extract (CLE) and metformin (MET) in tail suspension test on day 12.
**Figure 8**: Effect of curcuminoids enriched turmeric extract (CLE) and metformin (MET) on plasma glucose level in male mice.
Figure 9: Effect of curcuminoids enriched turmeric extract (CLE) and metformin (MET) on plasma insulin level in male mice.
Figure 10: Effect of curcuminoids enriched turmeric extract (CLE) and metformin (MET) on plasma cortisol level in male mice.
DISCUSSION

Increase hot plate reaction time

CLE & MET

Compensated thermal stimuli induced basal rectal temperature

Compensated thermal stimuli induced body weight loss
CLE

- Decrease corticosterone mediated enhanced metabolism
- Modulate the hypothalamic pathway
- Modulate Dysfunctional thermoregulation

• Bhatia et al., 2011
Antidepressant Activity

- 5 Hydroxy-tryptamine
- Nor-epinephrine
- MAO activity
- Neurogenesis

Likely to be modulated by CLE

- Xia et al., 2007; Shrinivas et al., 2008
CONCLUSION

• Bio-assay system used in this study is well suited for identifying analgesics and antidepressants like effects of CLE and metformin like stress response modifiers.

• CLE could be potent therapeutic option for treatment of co-morbid psychopathologies associated with environmental stress.
REFERENCES


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THANK YOU

ANY QUERIES?