Antinociceptive activity evaluation of an Indonesian herbal product Sekalor 33A in Swiss albino mice

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ABSTRACT

The antinociceptive activity of an Indonesian herbal product named Sekalor 33A was evaluated in Swiss albino mice in acetic acid-induced abdominal pain model. The product, when administered to mice at doses of 25, 50, 100 and 200 mg per kg body weight, reduced the number of acetic acid-induced gastric constrictions by 30.0, 33.4, 46.6, and 50.0%, respectively. The results were statistically significant at all doses of the product when compared to control animals. In comparison, a standard antinociceptive drug, aspirin, when administered at doses of 200 and 400 mg per kg body weight, reduced the number of gastric constrictions in mice, respectively, by 33.4 and 66.6%. The results suggest that the herbal product is comparable to aspirin in alleviation of pain and validates the use of this product for headache arising from flu, indigestion, and stress.

Key words: Antinociceptive activity, Indonesian herbal product, Sekalor 33A, Swiss albino mice

Introduction

Pain is experienced by numerous people all over the world on a daily basis. Pain can arise from a number of factors including stress, ailments like malaria, dengue, or influenza, as well as injuries. Other factors inducing pain include indigestion, gastric ulceration, cancer, and rheumatism. Various over the counter drugs like aspirin and paracetamol are used to alleviate pain. However, these drugs suffer from problems like causing gastric ulceration or hepatotoxicity following over-dosage or chronic use. As a result, there is a necessity for finding newer and more efficacious drugs and herbal products can be an effective and readily affordable substitute for available allopathic drugs.

We had been conducting ethnomedicinal surveys among the folk and tribal medicinal practitioners of Bangladesh for the last several years (Rahmatullah et al., 2009a-c; Rahmatullah et al., 2010a-g; Rahmatullah et al., 2011a,b; Rahmatullah et al., 2012a-d). From the information obtained from the traditional healers, further studies are conducted on selected floral species towards evaluation of their antinociceptive, antihyperglycemic, and cytotoxic potential (Anwar et al., 2010; Jahan et al., 2010; Khan et al., 2010; Mannan et al., 2010; Rahman et al., 2010; Rahmatullah et al., 2010h; Shoha et al., 2010; Ali et al., 2011; Barman et al., 2011; Hossan et al., 2011; Jahan et al., 2011; Rahman et al., 2011; Sutradhar et al., 2011; Ahmed et al., 2012; Arefin et al., 2012; Haque et al., 2012; Sathi et al., 2012). Towards an extension of this research, we have recently also started conducting studies on herbal products of other countries, particularly to evaluate their claimed antinociceptive potential. Sekalor 33A is an herbal product of Indonesia and is used to obtain relief from headache caused by flu, indigestion, or stress. It was the objective of the present study to evaluate the antinociceptive potential of Sekalor 33A in acetic acid-induced gastric pain model in Swiss albino mice.

Materials and Methods

Sekalor 33A was obtained from an herbal shop in Kuala Lumpur, Malaysia in 2012. The product was sold in 7g sealed packets, the contents of which were to be used for two doses on a single day. The front side of the packet (Fig 1) bore the words Jamu Obat Alami, Sekalor 33A (Sakit Kepala). The address of the manufacturer was given as Fabrik Jamu, AIR MANCUR®, Wonogiri-SOLO-Indonesia. The composition given on the reverse side of the packet (Fig 2) listed the following ingredients – Achyranthi Follium 10%, Curcumae Rhizoma 20%, Zingiberis Rhizoma 15%, Zingiberis aromaticae Rhizoma 15%, Zingiberis purpurei Rhizoma 10%, Cinchonae cortex 10%, and Corrigents 25%. Indications given on the reverse side of the packet mentioned “Cure headache arising from flu, indigestion, and stress.”

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caused by flu, indigestion, stress”. Directions given on the reverse side of the packet mentioned “Mix the contents of 1 packet with half a glass (100 ml) of boiling water. Take 1 packet twice daily”. The contents of each packet were weighed and found to be 7g. Storage was recommended in a dry place.

Experimental dosages for mice experiments were determined on the basis of the packet content of 7g per human being, the average weight of a human being taken as 70 kg, i.e. 2g per 10 kg body weight, or 200 mg per kg body weight (when one packet is taken twice daily). The various doses for experimental purposes were fixed based on this afore-mentioned calculation as 25, 50, 100 and 200 mg per kg body weight of mice. Stock solution of Sekalor 33A was made by suspending 1g of packet contents in 10 ml distilled water.
Chemicals:

Glacial acetic acid was obtained from Sigma Chemicals, USA; aspirin was obtained from Square Pharmaceuticals Ltd., Bangladesh.

Animals:

In the present study, Swiss albino mice (male), which weighed between 22-25g were used. The animals were obtained from International Centre for Diarrheal Disease Research, Bangladesh (ICDDR,B). All animals were kept under ambient temperature with 12h light followed by a 12h dark cycle. The animals were acclimatized for three days prior to actual experiments. The study was conducted following approval by the Institutional Animal Ethical Committee of University of Development Alternative, Dhaka, Bangladesh.

Antinociceptive Activity:

Antinociceptive activity of Sekalor 33A was examined using previously described procedures (Shanmugasundaram and Venkataraman, 2005). Briefly, mice were divided into seven groups of six mice each. Group 1 served as control and was administered vehicle only. Groups 2 and 3 were orally administered the standard antinociceptive drug aspirin at a dose of 200 and 400 mg per kg body weight, respectively. Groups 4-7 were administered Sekalor 33A at doses of 25, 50, 100 and 200 mg per kg body weight, respectively. All mice were individually weighed and dose determined on the basis of individual weight. Following a period of 60 minutes after oral administration of standard drug or extract, all mice were intraperitoneally injected with 1% acetic acid at a dose of 10 ml per kg body weight. A period of 15 minutes was given to each animal to ensure bio-availability of acetic acid, following which period, the number of abdominal contractions was counted for 10 min.

Statistical Analysis:

Experimental values are expressed as mean ± SEM. Independent Sample t-test was carried out for statistical comparison. Statistical significance was considered to be indicated by a p value < 0.05 in all cases.

Results and Discussion

The herbal product Sekalor 33A, when administered at doses of 25, 50, 100 and 200 mg per kg body weight demonstrated dose-dependent and statistically significant reductions in the number of abdominal contractions in mice induced by intraperitoneal administration of acetic acid. The results were statistically significant at all doses of the product tested. At the afore-mentioned four doses, the percent reductions in the number of contractions were, respectively, 30.0, 33.4, 46.6, and 50.0. A standard antinociceptive drug, aspirin, by comparison, when administered at doses of 200 and 400 mg per kg body weight, reduced the number of abdominal contractions in mice, respectively, by 33.4 and 66.6%. The results demonstrate that Sekalor 33A, at least at the higher three doses is comparable to or better than aspirin (200 mg per kg body weight) in terms of alleviation of gastric pain induced by acetic acid injection. The results are shown in Table 1.

Jamu herbal medicines are the traditional medicines of Indonesia, which country after Brazil, contains the largest number of diverse floral species, including possible medicinal plants. These plants and herbal formulations containing these medicinal plants can go a long way in alleviation of many of the diseases suffered by the human population throughout the world. The use of several plant parts used in this herbal formulation has been scientifically validated. The analgesic and anti-pyretic activities of Curcuma longa (synonym: Curcuma domestica) rhizome extracts has been shown in rats (Neha et al., 2009). The anti-inflammatory and analgesic properties of Zingiber officinale rhizome extract has also been shown (Raji et al., 2002). Various Cinchona species, have from ancient times, been used to treat malaria with accompanying fever and pain. Thus the plants, used in combination, can prove effective in relief of headache, which is also borne out by the present study.

Table 1: Antinociceptive effect of Sekalor 33A in the acetic acid-induced gastric pain model mice.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose (mg/kg body weight)</th>
<th>Mean number of writhings</th>
<th>% inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (Group 1)</td>
<td>10 ml</td>
<td>5.00 ± 0.26</td>
<td>-</td>
</tr>
<tr>
<td>Aspirin (Group 2)</td>
<td>200 mg</td>
<td>3.33 ± 0.56</td>
<td>33.4*</td>
</tr>
<tr>
<td>Aspirin (Group 3)</td>
<td>400 mg</td>
<td>1.67 ± 0.76</td>
<td>66.6*</td>
</tr>
<tr>
<td>Sekalor 33A (Group 4)</td>
<td>25 mg</td>
<td>3.50 ± 0.56</td>
<td>30.0*</td>
</tr>
<tr>
<td>Sekalor 33A (Group 5)</td>
<td>50 mg</td>
<td>3.33 ± 0.71</td>
<td>33.4*</td>
</tr>
<tr>
<td>Sekalor 33A (Group 6)</td>
<td>100 mg</td>
<td>2.67 ± 0.42</td>
<td>46.6*</td>
</tr>
<tr>
<td>Sekalor 33A (Group 7)</td>
<td>200 mg</td>
<td>2.50 ± 0.22</td>
<td>50.0*</td>
</tr>
</tbody>
</table>

All administrations (aspirin and Sekalor 33A) were made orally. Values represented as mean ± SEM, (n=6); *P < 0.05; significant compared to control.
Financial Disclosure:

Authors of this study have no financial interest in any of the product(s) or manufacturer(s) mentioned in this article.

References


