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MEETING ABSTRACT

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Gender-specific analgesic action of thymol

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Background: Thymol is a volatile monoterpene being one of the major compounds of volatile oils of several plants like the Labiatae family which have ethnomedical use since antiquity for various diseases including pain and inflammatory diseases. Thymol is reported as antioxidant, antimicrobial, hepatoprotective, positive allosteric modulator of GABA_A receptors and to activate transient receptor potential (TRP) ion channels, TRPA1 and TRPV3. The aim of this study was to investigate the gender-specific action of thymol in mice.

Methods: Thymol was commercially obtained and diluted in DMSO (100 mg/kg). Mechanical and thermal algescic stimuli were used in the experiments. Application of a bulldog clamp on the tail of Balb/c albino mice of either sex was used as mechanical algescic stimulus, and 52 °C water for thermal algescia. Cut-off time ($t_{cut-off}$) was 15 sec; pre-drug and post-drug withdrawal latencies ($L_{pre-drug}$, $L_{post-drug}$) were used to calculate percent analgesia as follows:

$$\% \text{ analgesia} = \left(\frac{L_{post-drug} - L_{pre-drug}}{t_{cut-off} - L_{pre-drug}} \right) \times 100$$

The R statistical package was used for the statistical evaluation and plotting. Differences between values were tested using Student's *t*-test; the null hypothesis was rejected when *p* was < 0.05.

Results: Analgesic action of thymol was observed in male mice but there was no effect in female mice. Differences on mechanical and thermal algescic stimuli were observed (*p* values were 0.005 and 0.040, respectively).

Discussion: Thymol is a small compound composed of a benzene ring substituted with methyl, isopropyl and hydroxyl groups. Although being a simple, hydrophobic volatile compound, and having similarity to propofol it was not surprising to see GABA-mimetic activity of thymol. TRPA1- and TRPV1-binding properties of thymol make it a compound having multiple sites of actions. To the best of our knowledge, the present results are the first to report a gender-specific action of thymol in analgesic tests. Male but not female animals will be appropriate in order to evaluate the actions of thymol and similar monoterpenes.

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