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## Development and validation of analytical method for simultaneous estimation of paracetamol and thiocolchicoside by RP-HPLC in bulk and pharmaceutical dosage form

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A simple, precise, and accurate HPLC method has been developed and validated for assay of combined dosage form of Paracetamol and Thiocolchicoside in commercial pharmaceutical dosage form. Reversed-Phase liquid chromatographic analysis was performed on a BDS hypersil C18, 250mm × 4.6mm, 5µm (particle size), Thermo scientific column using Potassium Dihydrogen phosphate: Methanol (40:60, v/v) as eluent. The flow rate of the mobile phase was adjusted to 1.0 ml/min and the injection volume was 20 µl. Detection performed at 247nm. The retention time of Paracetamol and Thiocolchicoside were found to be 3.27 and 5.50 respectively. The method was validated for linearity, precision, accuracy, robustness. Response was a linear function of drug concentration in the range with 250-750 µg/ml for paracetamol and 1-3µg/ml for thiocolchicoside. Intraday and Interday precision were determined. Accuracy of Paracetamol and thiocolchicoside was found between 99-100%. All analytical validation parameters were determined by following the ICH guidelines and its limit. The developed method proclaimed to be precise and robust for the estimation of Paracetamol and Thiocolchicoside in their combined dosage form.

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## The extinction of placebo and nocebo effects

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The placebo/nocebo effect can be defined as a positive/negative treatment response to a substance or procedure known to be without any therapeutic effect. Although placebo/nocebo effect has been widely used in scientific research of pain and other domains, most attention has been focused on its short-term effect. Prolongment of an analgesic placebo effect and eradication of a hyperalgesic nocebo effect are crucial to achieve high clinical efficacy. Here, we developed a non-invasive behavioral technique to manipulate the long-lasting effect of initiated placebo/nocebo effect in pain perception. Subjects first learned the association between cues and high/low pain stimulation. Then an identical pain was always coupled with cues, presented either supraliminally or subliminally, in the test session. After that, subjects underwent the extinction stage, in which they received warm stimulations coupled with these cues. Another test session was administrated to test the effect of extinction. We found that significant placebo/nocebo effects after conditioning in both the supraliminal condition and the subliminal condition, although effects in the subliminal condition was significantly smaller than those in the supraliminal condition. Importantly, extinction manipulation erased conscious placebo effect but did not influence conscious nocebo effect and subliminal placebo/nocebo effects. Our study suggests that unconscious placebo/nocebo effects are difficult to override and unlike conscious placebo effect, conscious nocebo effect is more resilient to extinction.

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