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**EVALUATION OF PAIN-KILLING ACTION OF ACETYLSALICYLIC ACID
NANOPARTICLES ON THERMAL NOCICEPTION IN MICE**

Abstract:

Pain is a common experience that can range from mild annoyance to debilitating agony. As such, finding effective ways to relieve pain is a crucial aspect of healthcare. Aspirin, a nonsteroidal anti-inflammatory drug (NSAID), is a commonly used analgesic that works by inhibiting the production of prostaglandins, which are responsible for causing pain. However, the effectiveness of aspirin can be influenced by various factors, including the form in which it is administered. The current study aimed to compare the effects of aspirin's ordinary particles and nanoparticles as an analgesic utilizing the hot plate method in topical formulations (gel, ointment, cream). The study employed 120 albino mice, all males, divided into six groups. In the three groups, aspirin was topically applied using various formulations (gel, cream, and ointment, respectively) and concentrations (0.25, 0.5, and 1%). The same composition and concentration of aspirin nanoparticles were administered to the other three groups. The reaction time was assessed after aspirin was topically applied at 2, 10, 20, 30, 40, 50, and 60-minute intervals. Extended delay durations in comparison to control values were used to express the effects of aspirin. The results of the study showed that aspirin nanoparticles produced the best analgesic impact, followed by the cream and then the ointment, according to the data. This suggests that the form in which aspirin is administered can significantly influence its effectiveness as an analgesic. The use of nanoparticles may increase the bioavailability of aspirin, allowing it to be more efficiently absorbed by the body and produce a more significant analgesic effect. Overall, the study's findings suggest that aspirin nanoparticles may be a more effective form of aspirin for pain relief than ordinary particles. Further research is needed to explore the potential benefits and drawbacks of this form of aspirin and determine its efficacy in human subjects. Nevertheless, the current study provides valuable insights into the factors that can influence the effectiveness of aspirin as an analgesic and may inform future developments in pain management.