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Comparative antinociceptive effect of aspirin and aspirin nanoparticles in semisolid formulae in mice

ABSTRACT

Aspirin are commonly used analgesic, anti-inflammatory, and anti-pyretic drug in medicine, oral route is the most common one for drug administration as a result it will produce different adverse effects like peptic ulcer, nephropathy, and thrombocytopenia even with low and continuous therapeutic dose, so the alternative topical route is preferable with minimal adverse effects and effective concentration. Therefore, in the present study was to investigate whether the antinociceptive property of aspirin would enhance if used aspirin as nanoparticles after preparing it in several forms (gel, cream and ointment). Thirty-two healthy male mice weighing 30-35 gm. were used in the present study. The animals were divided as a randomized design. Each mouse was treated topically. All drug concentration of aspirin was prepared using gel, cream and ointment as vehicle and topically application on fore and hind paw of experimental animals. Pain was induced by application of hot plate for assessment of latency of pain stimulus. Time from placement to jumping or hind paw licking was recorded as latency of response. The result showed that the median effective concentration (EC₅₀) for analgesic effect of aspirin (gel, cream, and ointment) were 0.848, 0.958 and 1.00% respectively while these EC₅₀s were decrease when used nanoparticles aspirin (gel, cream and ointment) to 0.72, 0.657, and 0.701% respectively. In conclusion, topical applied of aspirin will produce effective therapeutic antinociceptive effects in mice although gel preparation produce a better response followed by cream, then ointment due to pharmacokinetic properties. Also nanoparticle preparation will produce superior response in all forms, whether Nano aspirin is prepared in gel form, cream or ointment