

## Treatment of Premalignant Lesions: Curcumin a Promising Non-Surgical Option

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**Abstract :** Introduction: Curcumin (Cur) is a polyphenol derived from the herbal remedy and dietary spice turmeric. It possesses diverse anti-inflammatory and anti-cancer properties following oral or topical administration. The buccal delivery of curcumin can be useful for both systemic and local disease treatments such as gingivitis, periodontal diseases, oral carcinomas, and precancerous oral lesions. Despite of its high activity, it suffers a limited application due to its low oral bioavailability, poor aqueous solubility, and instability. Aim: Preparation and characterization of curcumin solid lipid nanoparticles with a high loading capacity into a mucoadhesive gel for buccal application. Methodology: Curcumin was formulated as nanoparticles using different lipids, namely Gelucire 39/01, Gelucire 50/13, Precirol, Compritol, and Polaxomer 407 as a surfactant. The SLN were dispersed in a mucoadhesive gel matrix to be applied to the buccal mucosa. All formulations were evaluated for their content, entrapment efficiency, particle size, in vitro drug dialysis, ex vivo mucoadhesion test, and ex vivo permeation study using chicken buccal mucosa. Clinical evaluation was conducted on 15 cases suffering oral erythroplakia and erosive lichen planus. Results: The results showed high entrapment efficiency reaching almost 90 % using Gelucire 50, the loaded gel with Cur-SLN showed good adhesion property and 25 minutes in vivo residence time. In addition to stability enhancement for the Cur powder. All formulae did not show any drug permeated however, a significant amount of Cur was retained within the mucosal tissue. Pain and lesion sizes were significantly reduced upon topical treatment. Complete healing was observed after 6 weeks of treatment. Conclusion: These results open a room for the pharmaceutical technology to optimize the use of this golden magical powder to get the best out of it. In addition, the lack of local anti-inflammatory compounds with reduced side effects intensifies the importance of studying natural products for this purpose.

**Keywords :** curcumin, erythroplakia, mucoadhesive, pain, solid lipid nanoparticles

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