Characterisation of hydrogels with agomelatine as a coating for 3D printed transdermal drug delivery systems

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Agomelatine (AGM) is an atipical antidepressant drug approved for use in the European Union in 2009. It acts on melatonin and serotonin receptors. The drug is effective in both the acute and continuation phases of depression treatment and is also used in the treatment of anxiety disorders [1]. Currently, AGM is only administered in tablet form and has a low bioavailability <5% [2]. Recently, the concept of using a transdermal route of administration has emerged to increase the bioavailability of AGMs [3,4]. The use of the transdermal route prevents drug degradation in the gastrointestinal tract and first-pass effects in the liver and may maintain therapeutic levels of the drug [3]. Microneedles can be used to deliver the drug to the dermis, where it can enter the systemic circulation through small vessels and make drug delivery more efficient [5].

Raman spectroscopy is a nondestructive, highly sensitive analytical technique that does not require special preparation of the sample. This makes it an increasingly popular tool in the pharmaceutical industry used e.g. to identify active substances, excipients and polymorphic forms, as well as for the distribution of substances in the final drug formulation [6].

The main aim of the present study was to characterise two types of gels (with and without ethanol) for application to the skin. Differences between ethanol gels and AGM-containing suspensions were noted [7]. Micro-needle systems obtained using various 3D printing techniques will also be presented.

Keywords: agomelatine-loaded hydrogels, Raman spectrtroscopy, 3d printing, microneedel

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