Evaluation of Topical Photo-Enhancer Assisted Intense Pulsed Light versus Methylene Blue Assisted Intense Pulsed Light for Treatment of Seborrheic Keratosis

Thesis

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Israa Mohammed Salahuldin

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INTRODUCTION

Seborrheic keratosis (SK) is one of the most common benign epidermal tumors that affects both sexes equally, and usually arises in individuals older than 50 years ***(Lee et al., 1992; Kwon et al., 2003).***

It presents as sharply demarcated, slightly raised brownish patches or plaques, usually on sun-exposed surfaces of the skin ***(Park et al., 2014; Elder et al., 2009).*** The clinical presentation can be quite variable and includes clinical variants, such as stucco keratosis and dermatosis papulosa nigra ***(Elder et al., 2009).***

Seborrheic keratosis may simulate other lesions, such as common warts, lentigines, melanocytic nevi, actinic keratosis, and Bowen disease, or occasionally more aggressive entities, such as basal cell and squamous cell carcinomas, or even cutaneous melanomas ***(Kim et al., 2013).***

It can be divided into six major histopathological variants: acanthotic, hyperkeratotic, adenoid, irritated, clonal, and melanoacanthoma. Histopathologically, all of the subtypes have three features in common: hyperkeratosis, acanthosis, and papillomatosis. On low to moderate power magnification, the base of the lesion lies roughly on an imaginary axis drawn between two dermoepidermal junctions at both ends of the surrounding normal tissue ***(Elder et al., 2009).***

Photodynamic therapy (PDT) is a technique that utilizes reactive oxygen species produced by a nontoxic dye or photosensitizer molecule in the presence of low intensity visible light to kill mammalian or microbial cells ***(Macdonald et al., 2001).*** The advantages of PDT are numerous; it is a safe, noninvasive technique which yields effective therapeutic results ***(See et al., 2016).***

Intense Pulsed Light (IPL) is a broadband visible light emitted from a non-coherent, filtered flash lamp. IPL sources emit light in the 500-1200 nm range and allows treatment of melanocytic lesions ***(Babilas et al., 2010).*** Methylene blue (MB) is a widely known histological dye that has been in use to stain living organisms for many years. It belongs to the phenothiazinium class of compounds. It is well known to be photo dynamically active. The characteristic color of MB is caused by the strong absorption band in the 550–700 nm regions. Methylene blue has shown in vivo activity against several types of tumors when locally injected and illuminated with red laser light ***(Moreira et al., 2012).***

Laser treatment has been reported for treatment of such lesions, but pain is often a problem, requiring some form of anesthesia. It is sometimes painful to obtain improvement of pigmented spots by laser treatment. Intense pulsed light (IPL) is less painful, and has become widely used for pigmented lesions with satisfactory results for patients with distinct, clearly demarcated pigmented lesions. However, when attempting to

treat less well demarcated lesions which are difficult to clearly identify even by inspection, IPL treatment can be less than satisfactory especially in patients with darker skin types. In addition, when IPL is used to treat thick melanogenic lesions such as seborrheic keratosis, high energy is required to remove such lesions successfully. Both indistinct, difficult to identify pigmented lesions and thick, well-pigmented lesions like seborrheic keratosis present a real challenge when IPL treatment is applied ***(Sarkar et al., 2002).***

Aim of the Work

To evaluate the efficacy and safety of topical carbon gel photo-enhancer assisted intense pulsed light versus methylene blue assisted intense pulsed light photodynamic therapy for treatment of Seborrheic Keratosis.

SEBORRHEIC KERATOSIS

I-Introduction:

Seborrheic keratosis represents one of the most common benign epidermal tumors that associate with increased age. The lesions manifest clinically as acquired, solitary or multiple, well demarcated brownish papules or plaques with a verrucous surface that predominantly localize at areas of the head, neck and trunk ***(Toll et al., 2008; Hafner et al., 2008).***

II-Incidence of SK:

Seborrheic keratosis affects both sexes equally, and affects approximetly 80-100% of people older than 50 years. It affects people all over the world but believed to be more common in Caucasians ***(Kwon et al., 2003).***

III-Etiology:

The etiology is not well-known, although heredity, sunlight and human papilloma virus (HPV) have been suggested as risk factors. Genetic studies have suggested that somatic mutations in Fibroblast Growth Factor Receptor 3 (FGFR3) gene are important in the development of these lesions ***(Neville et al., 2009).*** FGFR3 belongs to a class of Trans membrane tyrosinase kinase receptors involved in signal transduction to regulate cell growth, differentiation, and migration, as well as wound healing. Mutation in FGFR3 have