

## **Computerised image analysis of vitiligo lesion: evaluation using manually defined lesion areas**

### **ABSTRACT**

**Background:** Vitiligo is a cutaneous pigmentary disorder characterized by depigmented macules and patches that result from loss of epidermal melanocytes. Physician evaluates the efficacy of treatment by comparing the extent of vitiligo lesions before and after treatment based on the overall visual impression of the treatment response. This method is called the physician's global assessment (PGA) which is subjective. In this article, we present an innovative digital image processing method to determine vitiligo lesion area in an objective manner. **Method:** The digital method uses Independent Component Analysis (ICA) to generate melanin-based images representing skin areas due to melanin followed by Region Growing process to segment vitiligo lesion from normal skin. **Results:** Based on 41 digital images of vitiligo lesions taken from 18 patients, the proposed method achieved sensitivities of  $0.9105 \pm 0.0161$ , specificities of  $0.9973 \pm 0.0009$  and accuracies of  $0.9901 \pm 0.0028$  at 95% confidence level. **Conclusion:** With the proposed method, physicians are able to assess vitiligo treatment efficacies objectively.

**Keyword:** Digital image analysis; Independent component analysis; Melanin; Performance evaluation; Region growing; Vitiligo