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LETTER TO THE EDITOR

The potential use of artificial intelligence in the evaluation and treatment of patients with psoriasis

A potencial utilização da inteligência artificial na avaliação e tratamento de doentes com psoríase

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Dear Editor,

Artificial intelligence (AI) is a computer science that focuses on developing algorithmic programs that aim to reproduce human cognition and processes involved in the analysis of complex data. Recent advances in this field have improved current medical practice, particularly helpful in basic research, diagnosis accuracy, image recognition, treatment decision, and surgical assistance. Several AI studies have been focusing on dermatological disorders such as skin cancer, inflammatory dermatosis, and onychomycosis[1].

Psoriasis is an inflammatory skin disease that has been widely studied, although the molecular mechanisms and pathophysiology are not yet fully understood. AI has been implicated as a relevant and innovative tool in molecular biology, clinical assessment, customize treatment protocols, and outcome predictions in psoriatic patients[2].

Artificial intelligence (AI) has been tested for the clinical and histopathological diagnosis of psoriasis. For example, Shrivastava et al. achieved 99% clinical diagnostic accuracy with a support vector machine model after classifying 540 skin images[1]. In another study, the algorithm classified 8,021 images of eight common disorders (lichen planus, lupus erythematosus, basal cell carcinoma, squamous cell carcinoma, atopic dermatitis, pemphigus, psoriasis, and seborrheic keratosis), with a misdiagnosis psoriasis rate of 3% compared to 27% by dermatologists[3]. Furthermore, similar results were demonstrated between convolutional neural networks and dermatologists when comparing their performance in classifying dermoscopic images of psoriasis[4]. Pal et al. presented a computational framework that detects Munro's microabscesses in the epidermal stratum corneum of the skin from biopsy images[5].

The three most used indicators to evaluate psoriasis severity are the psoriasis area severity index (PASI), body surface area (BSA), and Physician Global Assessment (PGA). AI use in BSA and PASI measurements could greatly reduce the workload of doctors while ensuring a high degree of repeatability and standardization[2]. These tools could also allow long-distance follow-up of patients with psoriasis, which would be particularly interesting for locations with low access to differentiated health care. Currently, machine learning-based algorithms are already available to determine BSA scores, which have shown promising results, as they overcome dermatologists in measurement accuracy[6]. Besides no algorithm has been validated for scoring independently PASI score yet, recently Huang

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et al. proposed an image-AI-based PASI-estimating model that outperformed the average performance of 43 experienced dermatologists[2].

In addition to these applications, several recent studies report the usefulness of AI in the timely diagnosis of psoriatic comorbidities, including psoriatic arthritis, which may influence the prognosis of these patients. Mulder et al. found that by combining comprehensive peripheral blood immune cell flow cytometry with machine learning techniques, they were able to distinguish immune cell profiles that could differentiate patients with psoriatic arthritis who would benefit from timely referral to a rheumatology clinic[7].

Artificial intelligence (AI) has also shown promising results in the development of predictive models that can help identify psoriatic patients who are likely to respond to specific treatments. By analyzing data on a patient's medical history, genetics, and disease activity, AI algorithms can identify the most effective treatment options for that individual. This approach has the potential to improve patient outcomes and reduce the risk of side effects associated with ineffective treatments. Damiani et al. developed a predictive model using artificial neural networks on patients treated with secukinumab, predicting fast responders based on 15 continuous variables, such as BSA, white blood count, hemoglobin, platelets, and liver function tests[8]. AI has also been used in order to identify drug interactions based on semantic predictions extracted from medical databases and predict long-term responses to biologics[9,10].

Despite these promising applications, there are also challenges associated with the use of AI in psoriasis. One major challenge is the need for high-quality data to train these algorithms. This requires large datasets of patient information, which may be difficult to obtain in some cases. Additionally, there are concerns about the ethical and regulatory implications of using AI in healthcare, particularly in the context of patient privacy and data security[1].

In conclusion, AI is developing at lightning speed in the dermatological field, so its use in clinical practice is expected to increase exponentially in the coming years.

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