CASE AND RESEARCH LETTER

Artificial Intelligence in Chronic Urticaria: Unsupervised Versus Supervised Machine Learning

Inteligencia artificial en la urticaria crónica: aprendizaje sobre una máquina no supervisada frente a una supervisada

To the Editor,

Machine learning (ML) is a subset of artificial intelligence (AI) which most often utilizes image recognition and analysis for the diagnosis in most of the medical fields like dermatology, ophthalmology, radiology and medicine.[1] AI has potential role in dermatology such as screening and diagnosis of melanoma, basal cell carcinoma (BCC), psoriasis and other inflammatory dermatoses. ML is a method of creating AI. It has various approaches viz., supervised, unsupervised and semi-supervised or reinforcement learning.[2] Supervised approach uses labelled data and has been utilized in detecting benign versus malignant skin lesions. Unsupervised learning approach has been utilized in detecting dermoscopic diagnosis of BCC. Machine learning can also be applied in chronic urticaria (CU). Recently, in a study by Türk et al.,[3] authors have tried to distinguish different chronic urticaria (CU) subtypes phenotypically and pathogenetically through unsupervised model of machine learning. The authors have generated four clusters in their study which corresponded to a specific phenotypes and biomarkers. ML has much more potential in CU. Lesions in CU look the same but ML can also play a role in defining the severity through the number and size of the wheal. Larger wheal size corresponds to more severe and difficult to treat CU.[4] The number of lesions may be detected through an algorithm in ML which may aid in generating another cluster of CU with increased severity. The clustering in unsupervised learning is advantageous when data seems substantially different to one another. However, in CU data may not vary much therefore, there is a concept of semi-supervised learning in ML which utilizes both labelled and unlabelled data.[2] This approach would be much practical and easy which can utilize less labelled data and more unlabelled data for its operation. The qualitative data other than the images may be better utilized in defining and differentiating subtypes of CU through this learning. The unsupervised learning may be more helpful in generating new clusters through the unlabelled data, but addition of labelled data may further provide precise information in CU.

Moreover, addition of data for the validated scores such as UAS7 (urticaria activity score) and UCT (urticaria control test) would really augment in classifying and differentiating the disease activity and control through ML.

AI in CU offers an innovative approach to develop diagnostic algorithms which may potentially aid in diagnosis and classifying the subtypes of CU. It may also augment in evaluation of multiple modalities or issues at the same time. Albeit, the development and validation of AI algorithms require large data inputs either learned or labelled data and unlabelled but ML in dermatology especially CU is a new untouched field which have bright future prospects. Therefore, large studies are required in future in this field to validate the findings.

Conflict of interests

The author declares no conflict of interest.

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Y.S. Pathania

Department of Dermatology, Venereology and Leprology, All India Institute of Medical Sciences, Rajkot, Gujarat, India
E-mail address: yashdeepsinghpathania@gmail.com