

Periodontal Artificial Intelligence, The Double Edges Sword

Sura Dakhil Jassim*

Department of Periodontology / College of Dentistry / University of Babylon/ Iraq

Editorial

For decades, the diagnosis of periodontal diseases was a source of arguments passing with a stage of evolution from being dependent on a primitive clinical recording passing with more developed tools (eg. Radiographs) till it reached in to more advance diagnostic means such as using biomarkers from microbiome, metabolome and proteome. In general, using artificial intelligence (AI) represented a transformational step in all disciplines not only in dentistry. In Periodontology, AI represents a promising step which may pave the way in to a revolution in a diagnosis which is accurate, and it could be reached in a reasonable time.

AI used in Periodontology aided in interpretation of radiograph, pathological samples, periodontal charting and recordings. All of them aid the clinicians in reaching the diagnosis, making appropriate treatment plan as well as determination and prediction of the prognosis. In addition, AI used in monitoring and evaluation of the patient's response to the treatments during maintenance phase. There is no doubt that AI helped in periodontal education for both patients and dental students . Therefore, advantages of AI in Periodontology are numerous and obvious and they became the interest of many recent researches.

For instance, artificial neural network (ANN) prediction for periodontitis progression was assessed, and it showed high accuracy , sensitivity and specificity when it used periodontal and demographic parameters .

In the same context, using AI tools in detecting bone loss showed high accuracy that assisted in determination of the staging and grading of periodontitis and they were similar or even superior in performance than humans.

Some studies targeted the natural language processing (NLP) and compare it to the humans in diagnosis of gingivitis. The results showed that NLP revealed an excellent performance which was comparable to humans. However in the same study , it was found that depending on BOP alone in reaching the diagnosis might be associated with a kind of overestimation or underestimation of the diagnosis . The latter is the stem of one of the disadvantages or challenges of AI. Another concern from using AI is the patients privacy and data management. Ethical challenge related with using AI required international legal guideline which represented the boundaries that should kept in mind while using AI tools. Another disadvantage of AI is the need for ongoing refinement and validation of the system as well as the growing concern about potential biases. Last not the least, the cost of using AI tools may represented a challenge especially in developing countries with restricted economy.

We can conclude from this editorial note that AI will assist clinician and it will not replace the clinician at least in near future. The concern should not be directed about AI which could replace humans but the concern should be directed about humans who uses AI who can replace humans without AI.

*Corresponding Author: Sura Dakhil Jassim, Department of Periodontology / College of Dentistry / University of Babylon/ Iraq

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