

Diabetes Diagnostic Markers in Periodontitis Patients

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Dear Editor,

Although the diagnostic role of the A1C is clear in patients with diabetes, as shown by evidence that even a reduction of 1% in the A1C level may also cause a reduction of 21% of death due to diabetes, 14% in myocardial defects and 37% in micro vascular complications (1), it appears that A1C cannot be a reliable diagnostic marker for the diagnosis of diabetes risk in diabetes-free patients with chronic periodontitis. Hayashida et al. (2) and Rajan et al. (3) observed a significant relationship between A1C levels and chronic periodontitis, in which the A1C levels in people with periodontal disease was reported to be higher than healthy controls; this trend was reversed in another study that showed higher A1C levels in healthy controls than chronic periodontitis patients (4). This finding is consistent with the study of Pajunen et al. (5), which demonstrated that the sensitivity of A1C $\geq 6.5\%$ for the diagnosis of diabetes is 39%, while 61% of individuals with diabetes had A1C $< 6.5\%$, and the measurement of A1C level had delayed the diagnosis of diabetes in 61% of the patients. Furthermore, Anand et al. (6) did not consider A1C as a reliable test for the diagnosis of diabetes since it is influenced by conditions such as malaria, anemia, ethnicity and infection. According to reports by the American association for clinical chemistry (7), when people are categorized based on their A1C level in groups of $< 5\%$, $5\% - 5.5\%$ and $> 5.5\%$, the risk of cardio-vascular events, heart disease and stroke were minimum in the group with A1C levels between 5 and 5.5%, while it was maximum in the group with an A1C level higher than 5.5%. In the study of Ansari Moghadam (4), although the A1C level in healthy controls was higher than patients with chronic periodontitis, it ranged between 5 and 5.5% in healthy individuals and below 5% in chronic periodontitis patients. This implies that an A1C level below 5% might expose people to higher rate of mortality than those with A1C levels between 5 and 5.5%. However, the main question is which diagnostic test can be used as a gold standard predictor of diabetes in non-diabetic individuals? Unfortunately, a precise gold standard for comparing the diagnostic tests of diabetes is not available and, to date remains

controversial (8). Carson et al. manifested that changes in laboratory parameters had little effect on the prevalence of diabetes and the utilization of A1C instead of fasting plasma glucose (FPG) did not show a noteworthy change in the prevalence of diabetes and these two tests were similar in 97.7% of cases (9). However, epidemiological studies by Cowie et al. showed that the measurements with glucose plasma and A1C was different in various populations, as A1C could recognize 30% - 40% of diabetics whose disease was not detected, Whereas this rate was 50% for FPG, and 90% for two-hour plasma glucose (2-h PG) (10). Similar results were found by the IRAS study (11).

In major pathophysiologic abnormalities, A1C is a poor marker, while tests like FPG and two-hour PG run much better than any other diagnostic assay. If the diagnosis of diabetes is based only on A1C, a large proportion of patients with diabetes would be missed while detection of such patients is only possible with oral glucose tolerance test (OGT) (8).

Since periodontal infections caused by gram negative bacteria (G-), result in an insulin resistance increase, consequently deteriorated glycemic control, (increased insulin resistance may occur in both diabetic or non-diabetic individuals) (12) and the use of a OGT to assess the association between periodontal disease and diabetes risk may be more beneficial. To determine an appropriate gold standard for assessing the risk of diabetes in diabetic and non-diabetic individuals more studies should be conducted.

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