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The new antidiabetics in heart disease: can a glycemic holter predict the drug success?

Keywords: diabetes mellitus, glycated hemoglobin, circadian glycaemia, glycemic holter

Abbreviations: IDF, international diabetes federation; WHO, world health organization; FDA, food and drug administration; EKF, entwicklung konstruktion und fertigung

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Opinion

November 14 is the World Diabetes Day established in 1991 by the International Diabetes Federation (IDF) and the World Health Organization (WHO). The aim of the day is to raise awareness and inform public opinion about diabetes, a serious and widespread disease whose prevalence, according to the WHO, is constantly increasing.

In 2014 it was estimated at 8.5% of the world population, compared to 4.7% in 1980. According to these estimates, there were about 422million people affected by diabetes mellitus in the world, 64million within the WHO European Region (Global report on diabetes, WHO 2016). In Italy, based on ISTAT data, in 2016 a prevalence of known diabetes was estimated to be 5.3% (5.4% in men, 5.2% in women) equal to over 3million people. The prevalence increases with increasing age to a value of about 20% in people aged 75years or older.

Prevalence is on average lower in the northern regions (4.7 and 4.5%) than in the central (5.7%), southern (6.1%) and islands (5.8%) regions.

To diagnose diabetes, a fasting blood glucose value> 126mg/dl confirmed on at least two different days is sufficient, alternatively values greater than 6.5% of glycated hemoglobin confirmed by a second sample, or a blood sugar level >200mg /dl in the presence of symptoms. However, there is an underestimation of cases of diabetes secondary not only to superficiality and indolence but rather to the variability of circadian glycaemia.

More precise tests for the diagnosis of diabetes are the oral glucose load curve and the insulinemia level. Recently an interesting opportunity not yet codified by the industry guidelines is the glycemic holter. The first glycemic holter was approved by the US Food and Drug Administration (FDA) in 1999, and the design and performance of these devices have greatly improved since then.

To date, the diagnosis of diabetes through glycemic holter is not yet universally accepted. At the beginning, in fact, the results obtained by the devices were not so reliable and poorly reproducible compared to the reference tests.

But what we are seeing with regard to glycemic holters is increasing reliability associated with more accurate glucose measurements, longer sensor usage time, reliable alarms and an easy-to-use mobile application, and these are basic requirements. for greater acceptance of the device by the patient and regulatory bodies.

One of the latest devices made, the Glunovo®, released on the market not long ago, was developed to increase usability and performance and is proposed as an equipment capable of early detecting cases of diabetes mellitus not yet manifest.

This type of technology in fact has a sensor wear time of 14days and a longer monitoring, which increases the possibility of diagnosis by about 1400 times compared to that of an oral glucose load curve. The real-time glucose values measured by Glunovo CGMS were compared with venous blood glucose values measured by the Entwicklung, Konstruktion und Fertigung (EKF) blood glucose detector.[1] Although the diagnostic criteria with glycemic holter remain to be defined, it is clear that in the future the application of this method to diagnosis could make early diagnosis simpler and more effective.[2–10]

The new antidiabetics and the heart

Recently, some of the most innovative treatments for diabetes have established themselves in the treatment of cardiovascular complications of patients at greater risk.

Both SGLT-2 inhibitors and GLP-1 agonists have been shown to be effective in reducing cardiovascular events in two of the most prevalent cardiac diseases, namely heart failure and ischemic heart disease. However, the pathophysiological mechanisms underlying the real efficacy of these treatments have not yet been fully explained.

Moreover, the two classes of drugs act in a completely different way by interacting on receptor mechanisms located in different districts. In light of this evidence on the new antidiabetic drugs, in the last two years numerous evaluations on the capacity of hypoglycemic drugs already on the market (such as metformin and sulfonylureas) have accumulated in the trade journals.

It has been widely demonstrated that metformin is also effective in the prevention of heart failure heart disease and is able to reduce mortality in this class of patients. Diabetes is a chronic disease that causes high blood glucose values, which in turn are responsible for the development of lesions of the arteries which are the basis of the main cardiovascular diseases (heart attack and heart failure).

Compared to other people, diabetics have a 3-4 times increased risk of heart attack or stroke. In diabetics, severe changes in blood supply to the feet are 20 times more frequent than in healthy people. Diabetes can also damage the eyes, kidneys and nervous system. If in addition to diabetes there is also an increase in blood lipids, arterial hypertension and overweight, it is called metabolic syndrome. This syndrome greatly increases the risk of cardiovascular disease.

What if the real effect of hypoglycemic agents was linked to hyperglycemia, perhaps subclinical and nocturnal?

In order to evaluate this phenomenon in decompensated patients, it is my opinion that the routine application of glycemic holter could represent an interesting opportunity.

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Conflicts of interest

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