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EXPERT'S CORNER: A PERSONAL APPROACH

Glucose tolerance test as a tool in the diagnosis of diabetes mellitus



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In everyday medical practice, it is essential to establish safe and reliable criteria for the diagnosis of diseases, so that when physicians encounter certain clinical circumstances, they are able to recognize the problem more easily and accurately, and thus provide the necessary therapeutic measures needed to solve the problem, or at least control it.

This applies for all diseases; however, the level of difficulty for the diagnosis of each pathology is different; some are relatively simple, while others are much more complicated. Take diabetes mellitus as an example of a pathology which represents different degrees of difficulty in establishing a diagnosis.

Diabetes mellitus is a chronic disease, one which has existed since the beginning of mankind. Today, many of the mysteries surrounding this disease have been explained through scientific research; moreover, the knowledge of this pathology has allowed medical science to more efficiently control most of the problems this pathology represents. However, despite how much we know about this disease, there are still many unanswered questions, and it continues to be highly prevalent amongst the general population, with increasing morbidity and mortality.

Recent publications, report that at the present, there are over 420 million people with diabetes mellitus. Calculations suggest that by the year 2025, if current incidence and prevalence tendencies remain unchanged,

the percentages of the population with diabetes will be as follows; 7.6% in the US, 14.5% in Mexico, 10.5% in Colombia and 12.2% in Argentina, and so on, increasing worldwide.¹

It is important to have tools which are simple yet safe. In other words, tools which have enough sensitivity to detect each and every one of the cases, and also have the proper specificity so that the disease is not under- or over-diagnosed.

Establishing a diabetes diagnosis is a task which ought to be faced by physicians from all specialties, since this disease does not respect age, gender, race or social class. Primary care physicians, as well as general practitioners, pediatricians, internists, surgeons and gynecologists, among others, may face a patient with diabetes. Therefore, it is important for them to know which diagnostic methods to use in order to accurately establish the diagnosis.

A large percentage of type-II diabetes cases do not represent significant difficulties, since the triad of polydipsia, polyuria and polyphagia is evident and quickly point the doctor in the direction of suspicion of diabetes.

However, a large percentage of patients are either asymptomatic, or the symptoms have not acquired enough intensity, and thus have not yet been detected by the patient.

This situation is different for type I diabetes, which occurs more frequently in children or young adults and where the previously mentioned symptoms are usually extremely evident and dramatic. And if there is not a timely diagnosis and the proper therapeutic measures are not taken, the metabolic alteration is quickly exacerbated and can lead to a circumstance of diabetic ketoacidosis in a

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very short period of time, sometimes in days, which remains a severe acute complication, and may even be fatal.

In cases of type II diabetes with classic symptoms, or type I diabetes with dramatic symptoms, ensuring the diagnosis with laboratory tests is quite simple, since either one or two determinations of 200 mg % of glucose or higher in blood and the presence of glycosuria are enough to accurately prove a diagnosis. When in doubt, or when glycemic is not over 200 mg %, we may need to re-apply the glycemic test or complement it with other tests, such as glucose in blood 2 h after administering an oral load of 75 g of dextrose (it must be dextrose). Some laboratories give the patients sugar, which is sucrose, by mistake or ignorance. This can lead to false interpretations. In these cases, if post-loading glucose remains over 140 mg % and under 200 mg %, it means that we are treating a patient, which is intolerant to carbohydrates but has not yet developed diabetes, and should be treated accordingly. These patients require periodical monitoring; since, over an undefined period of time, they have high probabilities of developing the disease.

So, when does it become necessary to conduct a glucose tolerance test in order to establish a diagnosis? As mentioned above, we can ensure diagnosis with a high percentage of patients with type II diabetes and most patients with type I diabetes with only one glycosuria and a glycemia. In fact, only a small percentage of cases require the full glucose tolerance test to be diagnosed.

Diabetes specialists, as well as endocrinologists, are probably the physicians, which order patients to undergo this method the least often. Why is that? There are several reasons: first, because in many cases the doubt fades after a thorough clinical history, where family background is researched, as well as the patient's weight and waist circumference, and the presence of other morbidities which are commonly found in patients with diabetes, such as obesity, high blood pressure, dyslipidemias (mainly hypercholesterolemia or hypertriglyceridemia), hyperuricemia, or gout (multiparity for women). The presence of one or more of these conditions makes the patient highly suspect for diabetes, and in these cases, a simple glucose determination over a fasting period and/or glycosuria followed by periodical monitoring may be enough without the need to conduct a full glucose tolerance test.

On the other hand, we should mention that the test is long, uncomfortable and expensive; moreover, interpretive criteria have varied with time and are not always reliable. Also, nowadays, in order to be certain, it is convenient to include the simultaneous determination of insulin, which, while very useful data, since it determines the presence or absence of hyperinsulinemia, improving diagnostic certainty, makes the test much more expensive for the patient.

I am under the impression that the glucose tolerance test has been overused for many different reasons, due to a lack of experience, ignorance, or other reasons. Sometimes patients are just sent to the lab so that he or she feels that the best efforts are being made. Sometimes we observe that a patient who has already been diagnosed with diabetes mellitus, either in the past or recently, is sent to have the curve test performed. Nothing could be more absurd; the test is conducted to help make the diagnosis, if the diagnosis has already been made, the test is unnecessary. In any

case, control tests ought to be used, such as glycosylated hemoglobin or self-monitoring.

In my personal opinion the test should be limited to very special cases and in general terms ought to be reserved for scientific research, with clear objectives and appropriate protocols. In medical practice, diagnosis can be made through simpler methods. Nevertheless, there are special cases, such as in obstetrics and gynecology, where this test is justified, or when there is doubt in the results of a routine post-load glucose test. This test is also usually conducted at 28 weeks of pregnancy, then if the result is abnormal, a full glucose tolerance test is necessary in order to clear up the situation and give the proper therapy if needed.

My personal advice noted above, of limiting full tests to very special cases and preferably to those patients within a study with complete and approved protocols, is not necessarily a reflection of what is accepted in worldwide published literature. There are still doubts and there are publications from different times and places by very prestigious authors such as those listed in the bibliography at the end of this article, authors who defend an opposing position regarding this point. For those who may be interested in this topic, we recommend these articles.²⁻⁵

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

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