

## INFLUENCE OF LABORATORY TEST FINDINGS ON THE DEVELOPMENT OF DIABETIC RETINOPATHY

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**Abstract:** Diabetes mellitus is a complex metabolic disease characterized by abnormal insulin secretion, an elevated fasting plasma glucose level and a host of end-organ complications. Retinopathy, as well as nephropathy, are important causes of blindness and renal failure, in addition to complications related to diabetes mellitus. Like this work, we sought to establish a correlation between the presence of proteinuria and the severity of diabetic retinopathy, and possibly diabetic nephropathy. For the present article, we sought to address diabetic patients not treated ophthalmologically, as previously described in other studies. The severity of diabetic retinopathy appears to be associated with the presence of proteinuria and nephropathy, in addition to other risk factors such as disease duration, type of diabetes and poor metabolic control.

**Keywords:** Diabetes mellitus. Laboratory tests. Diabetic retinopathy.

## INTRODUCTION

Diabetes Mellitus is a metabolic disease with systemic repercussions, caused by different factors, which may link hereditary and environmental variables. One of the different forms of pathophysiology of the disease results from abnormal insulin secretion, as well as elevation in blood glucose levels, affecting a series of organs, called target organs. Among this organic involvement, we can mention nephropathy, retinopathy, neuropathy and atherosclerosis. In addition, it is worth mentioning the microvascular involvement, such as the retina and the kidney, causing neuropathy and, consequently, blindness and renal failure.

Worldwide, diabetes is the leading cause of blindness in patients between 20 and 74 years of age who are diagnosed with diabetic retinopathy. Due to its wide range and involvement in the terrestrial scope, its

prevalence is imprecise. Furthermore, it is estimated that most of the affected patients present the referred disease after 40 years of age.

The emergence and worsening of the disease occurs silently and progressively, starting with a mild, non-proliferative retinopathy, with the appearance of microaneurysms, which may even lead to neovessels.

Among the possible risk factors that can be scored, we mention its chronicity for diabetic retinopathy, lack of metabolic control, insulin-dependent DM and nephropathy. The younger the diagnosed patient, according to some endocrinologists, up to 13 years, the lower the chance of progression to the aforementioned comorbidity.

Laboratory and ophthalmological examinations and specialized follow-up are fundamental for the adequate treatment of the disease, as well as the prevention of other patients. Through these exams, the most common finding is proteinuria, with even more fluctuating levels when addressing the severity of the disease.

## GOAL

To analyze laboratory findings in patients with diabetes mellitus associated with diabetic retinopathy.

## METHODOLOGY

The present work consists of a qualitative review of the literature that sought to address results found in research on the endocrinological and ophthalmological theme, whether in a comprehensive, orderly or systematic way. To carry out the work, the following steps were followed:

1. Selection of the corresponding themes;
2. Selection of samples found and used;
3. Analysis of the characteristics of the original research;
4. Analysis of the obtained results;

5. To carry out the review.

The scientific literature databases and the techniques used in carrying out the review were Google Scholar, Scientific Electronic Library Online (SciELO), Virtual Health Library, Latin American and Caribbean Literature in Health Sciences (LILACS), using the search engines: “diabetic retinopathy”; “laboratory changes in diabetes” and “diabetic retinopathy laboratory”.

Thus, the present work seeks not only to analyze the endocrinological interface within the different thematic points correlated to the ophthalmological front, aiming to shed light for an educational path, clarifying and raising awareness about the forms and importance of prevention.

## **DISCUSSION**

Faced with the increase in the number of cases of diabetic retinopathy, the risk factors for the development of the referred disease, as well as its progression, are increasingly investigated.

Up to the present moment, it is observed that the main predisposing factor to diabetic retinopathy is the period of occurrence of diabetes in the affected patient, according to the Diabetes Clinical and Complications Trial (DCCT). The same entity also noted that intensive and prior insulin therapy can delay the onset of conditions such as the aforementioned diabetic retinopathy, as well as nephropathy and neuropathy.

Due to metabolic differences between insulin-dependent and non-insulin-dependent diabetes mellitus, there is a higher prevalence of diabetic retinopathy in the first mentioned patients. Furthermore, it is speculated that this difference may be due to the age of the patients observed, and it is not possible to conclude this observed observation.

The same institution, when observing 1139 diabetic patients, found the presence of microalbuminuria in those who had diabetic retinopathy, thus suggesting a nephropathic link in those conditions.

In time, Klein and associates concluded that the proteinuria detected in diabetic patients is a risk factor for the development of proliferative diabetic retinopathy, even more so when the diagnosis of diabetes has been prior.

The mentioned factors such as age, creatinine dosage and even the gender of the patients, despite influencing the development of the disease, do not correlate with its worsening. Likewise, proteinuria and plasma creatinine, as well as in retinopathy, are also linked to nephropathy. But both are not reliable indicators of nephropathy and retinopathy.

The impairment of visual acuity establishes a direct influence with poor metabolic control, to the point that, the more uncontrolled the patient's metabolism, the greater the chance of developing this impairment.

## **CONCLUSION**

It is verified that diabetic retinopathy, as well as nephropathy, is characterized by the occurrence of proteinuria. However, its degree of severity still cannot be reliably correlated due to the lack of further studies in the area.

In addition to laboratory findings, other factors may influence the development and severity of the condition, such as: type of diabetes, form of treatment, duration of the disease and the patient's metabolic state.

Although not very significant, factors such as age, sex and plasma creatinine levels are also closely correlated with the condition.

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