

## Clinical and Epidemiological Characteristics of Patients with Diabetic Retinopathy Treated at the La Selva Ophthalmology Clinic

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### Abstract

The aim of the study was to determine the clinical and epidemiological characteristics of the patients with diabetic retinopathy attended at La Selva Ophthalmological Clinic during the months of January to December 2019. The research design was of a descriptive applied and quantitative type, with a descriptive and transversal level, the sample population was made up of 82 patients, the technique used was the survey and the questionnaire was used as instrument. Results indicated that the patients ages with diabetic retinopathy varied between 36 to 87 years, 52.4% of which were men and 47.6% were women.

The majority were self-employed workers and housewives with 34.1%, whereas the lowest was a doctor with 1.2%. The district with the highest rate was Tarapoto. 39% of them were normal weight and 25.6% suffered from obesity grade 1. The evolution of diabetes was dispersed (from 1 to 47 years old). All patients had type 2 diabetes. A total of 54 patients did not report diabetes in their a family history whereas 28 patients reported it, 30.5% had advanced proliferative diabetic retinopathy and 6.1% moderate non-proliferative diabetic retinopathy. Likewise, 58.5% presented cataract and 15.9% glaucoma, 87.8% presented symptoms as blurred vision and 8.5% showed vision loss; 66.7% presented as comorbidity arterial hypertension and 7.4% have kidney involvement. In conclusion, the patients ages were variable, mostly male, most were self-employed workers, the highest rate of origin was Tarapoto. Most were normal weight. The evolution of DM was scattered and all patients presented DM 2. 54 patients did not report a family history, the most frequent degree of retinopathy was advanced proliferative diabetic retinopathy, most had history of cataract, blurred vision and IBP comorbidity.

**Keywords:** Diabetic Retinopathy; Diabetes; Clinical Features; Epidemiology; Degrees of Diabetic Retinopathy

### Introduction

Diabetic retinopathy is a frequent consequence of diabetes and is the result of damage to the small blood vessels in the retina that progresses, and that over time can cause total blindness to those who suffer from it. Diabetic retinopathy is among the main causes of visual impairment and blindness in the world and is responsible for 5% of the 37 million blind people according to the World Health Organization (WHO), which considers it as one of the diseases priority of the eye [1]. Likewise, the Pan American Association of Ophthalmology considers diabetic retinopathy as the third cause of irreversible visual loss in the world [2], however, it is the first cause in people

of productive age in developing countries. The International Diabetes Federation estimates that in America there are approximately 64 million patients with diabetes, of which up to 40 percent have some degree of diabetic retinopathy [3], although the prevalence of diabetes mellitus is higher in men. Diabetic retinopathy affects women more [5]. However, recent epidemiological studies estimate that by the year 2030, 552 million people will have diabetes and these, therefore, will be at risk of developing macrovascular and microvascular complications, diabetic retinopathy being one of the potential complications that can not only lead to blindness, but also a deterioration in the quality of life of the person. Globally, by 2010, the prevalence of diabetic retinopathy was 126 million in people over 40 years of age and is expected to increase to 191 million people by 2030 [7]. The RACSS Rapid Assessment of Cataract Surgical Service and RAAB Rapid Assessment of Avoidable Blindness studies include seven studies carried out in Latin America, which project results of the percentage of blind people as a consequence of diabetic retinopathy, with Brazil being the country with the highest prevalence of blind people due to diabetes. (15.9%), followed by Cuba (9.2%) and Chile (8.5%).

In Peru, diabetic retinopathy represents 0.8% of the causes of blindness and 1.2% of severe visual impairment in people over 50 years of age, even the prevalence of blindness is double in patients with retinopathy diabetic than in those without it (9.4% and 4.6%, respectively) [9]. The prevalence of non-proliferative and proliferative retinopathy were 47.2% and 10.3%, respectively [10]. In another study where a retinal camera was used in 1222 patients, a prevalence of diabetic retinopathy of 23.1% was found, where 20.3% corresponded to non-proliferative retinopathy and 2.8% to proliferative retinopathy [9]. Similar to the world trend, diabetic retinopathy in Peru is one of the main ophthalmological complications along with problems of glaucoma, cataracts and intraocular hemorrhages, according to a database of patients who attend the Retina and Vitreous service of the INO [11]. In this regard, in 2018, the cases of patients with severe diabetic retinopathy have increased by 50% compared to 2017, being the second cause of consultation in the Retina INO service [12]. According to the director of the INO, in 2015, among the main forms that threaten vision is proliferative retinopathy: 14% of patients with diabetes mellitus 2 and clinically significant macular edema: 15% of patients with diabetes mellitus 2, which when treated early, they reduce visual loss by 50%. The prevalence of vision impairment caused by diabetic retinopathy has been increasing in Peru since 2011 and has spurred the health ministry to take action to address the disease.

The Selva Ophthalmology Clinic in Tarapoto, is recognized by the population as the health establishment specialized in ophthalmology and attends a high number of patients with visual disorders, among which is retinopathy, which is why, due to the limited number from studies concerning this condition, it is necessary to carry out the present study to determine the clinical characteristics and prevalence of diabetic retinopathy, taking the crowded center as a reference. The purpose of this research work is to characterize the cases of diabetic retinopathy presented in the jungle ophthalmological clinic as a reference center, in order to make a relevant contribution to the knowledge of the disease in a given place and time, which allows an adequate interpretation of the trends of this disease and contribute to a better prognosis of life and quality of it. It should be noted that, as diabetic retinopathy is one of the main causes of acquired blindness in working-age patients, it has the potential consequence of disability pension cases that generate a high social economic cost [17], therefore, through the results obtained.

### Aim of the Study

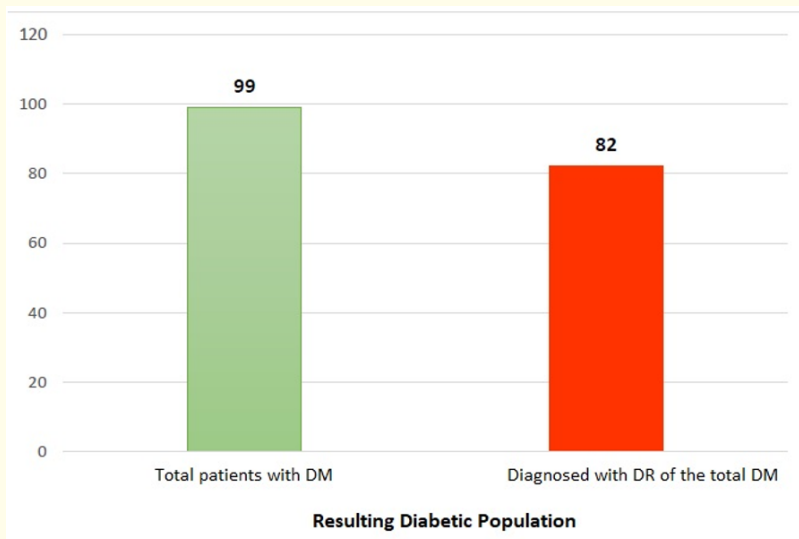
The aim is to identify the characteristics of the disease in order to contribute to the early diagnosis of the disease and the design of timely interventions to reduce its prevalence.

### Methods

The research was of an applied type, because it seeks to solve a practical problem using already validated, quantitative theory, because it uses data collection to describe a reality, based on numerical measurement and statistical analysis, to establish behavior patterns and test theories, of a descriptive and transversal type; because it determines the situation and describes the behavior of the variables at a

given moment in time. It is a field investigation, since data was collected directly from the reality where the events occur, without manipulating or controlling any variable. Likewise, a non-experimental, cross-sectional, descriptive design was used, since the clinical and epidemiological characteristics of diabetic retinopathy in a certain population were identified, which were described in their natural state, that is, as they were recorded in the observed reality. in the period of time studied. Data collection cards were used after reviewing the medical records, which led to the use of secondary source data collection.

**Results**



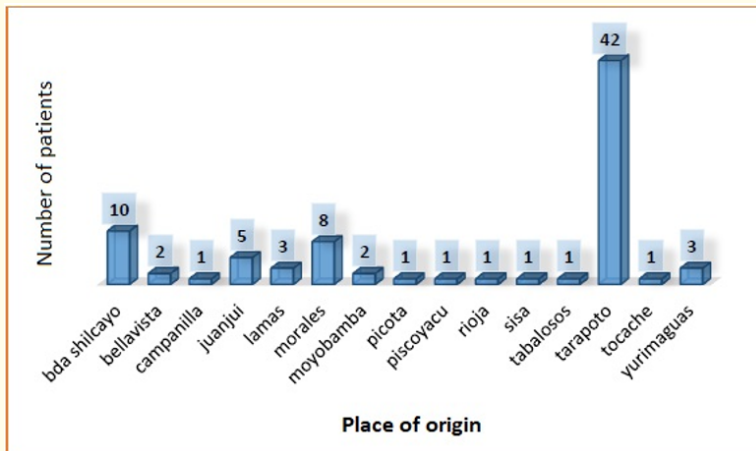
**Figure 1:** Frequency of presentation of diabetic retinopathy in patients seen at the La Selva Ophthalmology Clinic, during the months of January to December 2019.

In figure 1, we can see that of the total number of patients diagnosed with diabetes mellitus, which are 99 people, 82 people represent only diabetic patients who also have diabetic retinopathy.

Epidemiological Characteristics	N°	Minimum	Maximum	Half	Standard deviation
Age	82	36	87	60,27	9,401
Weight	82	34,00	110,00	68,2183	12,81908
BMI	82	19.53	34,84	26,7643	3,66936
Time of illness (years)	82	1	47	16,67	8,412
Source: self made					

**Table 1:** Epidemiological characteristics of patients with diabetic retinopathy treated at the La Selva Ophthalmology Clinic, during the months of January to December 2019.

In table 1, it is observed that there is a minimum age range of 36 years and a maximum of 87 years, with an average of 60 years (Figure 1). Regarding the weight of the patients, the mean is 68.22 kg, with a minimum weight of 34 kg and a maximum weight of 110 kg with a standard deviation of 12.82 kg. The Body Mass Index (BMI) has a mean of 26.76 and a standard deviation of 3.67. Finally, table 1 shows that the time of evolution of diabetes in patients has a mean of 16 years and 7 months and a standard deviation of 8 years and 4 months.



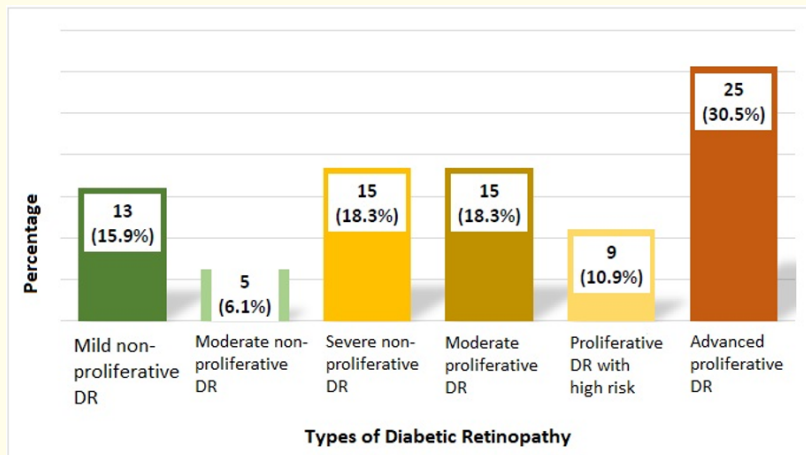
**Figure 2:** Place of origin of patients with diabetic retinopathy treated at the La Selva Ophthalmology Clinic, during the months of January to December 2019.

In figure 2, regarding the place of origin of the patients with diabetic retinopathy treated at the La Selva Ophthalmology Clinic during the months of January to December 2019, we can point out that the patients are mostly from Tarapoto with 42 patients, followed by the districts of the Banda de Shilcayo with 10 patients and morales with 8 patients, the other districts mostly only attended one patient.

BMI	Frequency	Percentage	Accumulated percentage
Normal weight	32	39	
	39		
Overweight	29	35.4	74.4
Obesity Grade 1	21	25.6	100
Total	82	100	
Source: self made.			

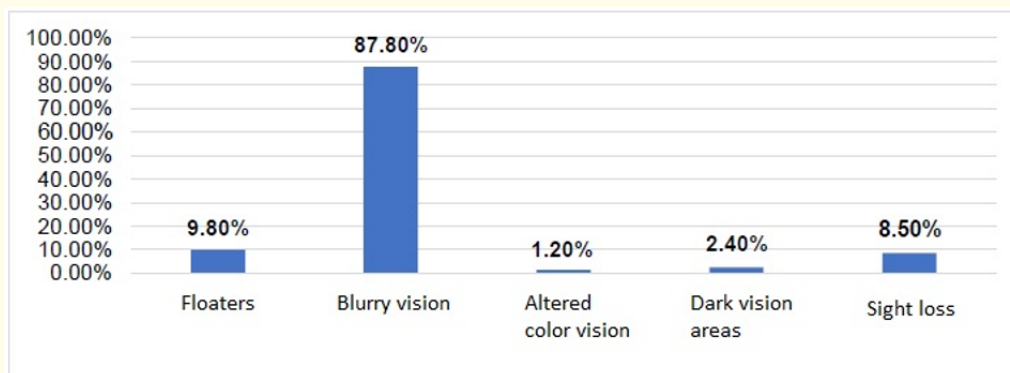
**Table 2:** BMI of patients with diabetic retinopathy treated at the La Selva Ophthalmology Clinic, during the months of January to December 2019.

As shown in table 2, the body mass index (BMI) of patients with diabetic retinopathy, corresponds mostly to normal weight (39%), followed by overweight with 35.4% and finally, grade 1 obesity equals 25.6%. That is, 61% of patients do not have their ideal weight.



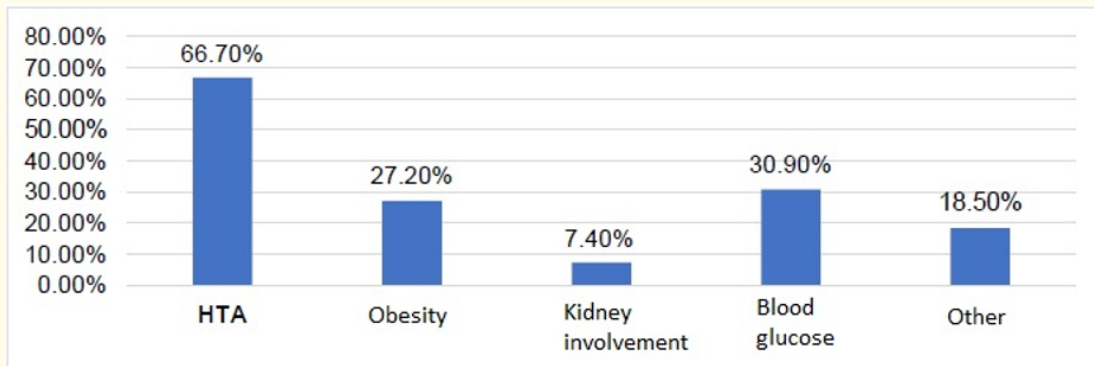
**Figure 3:** Type of diabetic retinopathy of patients who suffer from it, treated at the La Selva Ophthalmology Clinic, during the months of January to December 2019.

In figure 3, we can see that 59.8% of the patients had proliferative diabetic retinopathy: 30.5% of the patients had advanced proliferative diabetic retinopathy, 18.3% moderate proliferative and 10.9% proliferative with high risk. Regarding non-proliferative diabetic retinopathy, this corresponds to 40.3%, of which 18.3% have a severe case, 15.9% have a mild case and 6.1% of the patients present a case moderate.



**Figure 4:** Symptoms of patients with diabetic retinopathy treated at the La Selva Ophthalmology Clinic, during the months of January to December 2019.

It is observed in figure 4 that the most frequent symptom in patients with diabetic retinopathy is blurred vision (87.8%), followed by the floaters symptom with 9.8%; on the contrary, the symptom with less frequency is that of altered color vision (1.2%).



**Figure 5:** Comorbidities of patients with diabetic retinopathy treated at the La Selva Ophthalmology Clinic, during the months of January to December 2019.

In figure 5, it is observed that patients with diabetic retinopathy treated at the La Selva Ophthalmology Clinic, during the months of January to December 2019, have 66.7% arterial hypertension, 30.9% have Glycemia, 27.2% have obesity, 7.4% have kidney involvement and finally, 18.5% have other related diseases.

### Discussion

Regarding the epidemiological characteristics, in the frequency of diabetic retinopathy we can observe that of the total number of patients diagnosed with diabetes mellitus, which are 99 people, 82 people represent diabetic patients who also have diabetic retinopathy, giving a frequency of 82% which means that for every 100 diabetic people who visit the ophthalmology clinic, 82 have diabetic retinopathy, it should be noted that this value has no significance since there is no direct correlation for reasons that the data obtained were not taken randomly and that at the community level of the San Martín Region, there are cultural, geographical and socioeconomic biases that do not allow the casuistry of the Institution’s cases to be representative of that of the Region. For this reason, we see then that it does not coincide with other studies carried out both globally and nationally, that is why it is not possible, even if it is the wish, to expect that the prevalence results coincide or are exact, considering also that it is a question of a private healthcare center, which is why we speak of the frequency or percentage distribution of retinopathy. Villena JE, Yoshiyama CA (2011) [9], found a prevalence of diabetic retinopathy of 23.1%, while Leyton D (2018) [18], regarding the determination of the prevalence of Diabetic Retinopathy in patients Type II diabetics of the Viña de Mar CAPS have been determined to correspond to 9.5% of the studied sample [20], obtained as a result that the prevalence of diabetic retinopathy is 8.56%. In another investigation Santos - Bueso E., Fernández-Pérez C., Macarro A. (2016) where the prevalence of diabetic retinopathy in the outpatient clinic of Hospital Vitarte 2012 - 2014 was 10.11%.

Regarding the ages of the patients, there is an average of 60 years, with a minimum of 36 and a maximum of 87 years of age. González-Gutiérrez., *et al.* (2013) [26] found that the average age of patients with DR was 59.21 years, in Mexico. Also, Huamanchumo (2017) found that, of a population of 53 patients with DM, 41.51% are patients who are 60 years of age or older. Adrianzén., *et al.* in 2019 in Peru [1], found that the frequency of DR was higher in the age groups of 40 to 60 years and 60 to 80 years. Likewise, they mention that there were no cases of DR in people under 30 years of age, which is similar to the results of this research. Similarly, Santos-Bueso., *et al.* in 2007 in Spain [32], found that the mean age was 66.2 years.

Regarding the place of origin of patients with diabetic retinopathy treated at the La Selva Ophthalmology Clinic during the months of January to December 2019, we can point out that the majority of patients are from Tarapoto with 42 patients, followed by the districts of La Selva. Banda de Shilcayo with 10 patients and Morales with 8 patients, most of the other districts only attended approximately one patient. No studies carried out by other authors on place of origin were found, since it would not be a correlated factor, however, when presenting this innovative work from our region, it is important to determine that patients from rural areas have little activity both in the knowledge of its disease as well as its follow-up and it is therefore one of the epidemiological factors that is considered important, which is why the degrees of severe diabetic retinopathy prevail, which leads to multiple and more difficult management; at the same time emphasize the geographical factor that is also one of the causes of the small number of cases detected in the clinic.

Regarding the clinical characteristics, the results of the type of DR of the patients under study show that 59.8% of the patients had proliferative DR: within this, 30.5% of the patients had advanced proliferative DR, 18, 3% moderate proliferative and 11% proliferative with high risk. Regarding non-proliferative diabetic retinopathy, this corresponds to 40.3%, of which 18.3% have a severe case, 15.9% have a mild case and 6.1% of the patients have a moderate case and Carbajal A [45]. The overall prevalence of DR in a community is also influenced by the number of people diagnosed with early DM. In high-income populations with good health care systems, more people with early DM are diagnosed through screening systems and therefore the prevalence of DR in people with a recent diagnosis of DM will be low. The types of diabetic retinopathy have a lot to do with recovery and therefore with the ability to carry out daily activities of those who suffer from diabetic retinopathy, to know the severity of cases we have the concepts that Tenorio G, Ramírez-Sánchez V in which he classifies them in two ways: 1) Non-proliferative diabetic retinopathy, in turn, is divided into mild, moderate, severe and very severe. The venous pathway becomes tortuous and sometimes appears likely to progress to proliferative DR. 2) Proliferative retinopathy: Strictly speaking, it corresponds to the presence of newly formed vessels with gliosis bands that end with traction of the retina. Orrego (2018) [44], found that, for the most part, the patients presented non-proliferative DR (17.56% moderate non-proliferative DR, 13.88% mild). Likewise, Loza M. (2015) [23] found in a sample of 83 patients with DR, that the percentage of people with non-proliferative DR was higher (72.5%) than the percentage of patients with proliferative DR (27.5%). Likewise, Castillo J., *et al.* in 2016 [20], found different results from the present investigation, being the proliferative DR 1.84%, and the severe non-proliferative DR was 0.27%, non-proliferative DR moderate 1.38% and mild 5.07%; Castillo J., *et al.* [20] carried out their research in 442 patients with type 2 DM, in whom the prevalence of DR had decreased to 8.56%. This author mentions that this decrease is associated with the improvement in the control of modifiable risk factors.

The most frequent symptoms in DR patients are: blurred vision (87.8%), floaters (9.8%), loss of vision (8.5%), dark or empty areas of vision (2, 4%) and altered color vision (1.2%). Results similar to those found in Mexico by the Medio Camino National Health and Nutrition Survey - 2016 (Ensanut) [22], in which 54.5% of people with diabetes mellitus report blurred vision, 11.19% suffer damage to the retina and 9.9% suffer loss of vision. The cause of the floaters symptom is due to the detachment of the retina that can be manifested by said symptom or also by flashing lights.

The last clinical characteristic in the patients with DR in the present investigation refers to comorbidities, in which it was found that 66.7% had stage 1 hypertension, 30.9% had glycemia, and 27.2% had obesity. 7.4% renal involvement and 18.5% others (2014) [24] found similar results regarding hypertension, this was in an investigation carried out in Mexico in a total of 206 patients with DR, in which 75.2% (155 patients) presented arterial hypertension in stage 1, regarding kidney involvement, this was in 45.6% of the patients in this investigation and as regards obesity, it was only 6.8% indicates that in their research there was a high percentage of patients with DR who presented HT in stage 1. Similarly, Osorio I., *et al.* (2006) [34] indicate that obesity and HT are risk factors associated with DR in type 2 diabetic patients. Finally, with respect to the renal involvement presented in the patients of the present investigation (7.4%), Levey, *et al.* (2003) [37] indicate that the risk of kidney failure in diabetic patients is 25 times higher than in non-diabetics, becoming the main etiology of chronic kidney disease.



### Conclusion

Bearing in mind the population of patients with retinopathy, it is an alert that patients reach such a level of pathology, where the visual prognosis is reserved and even leads to irreversible blindness and shows poor control of the underlying pathology that can in the same way lead to complications of other organs.

From the epidemiological properties of the patients treated with Diabetic Retinopathy at the jungle ophthalmology clinic, we have the possibility to see that of the total number of patients diagnosed with diabetes mellitus, who are 99 people, 82 people represent only diabetic patients who also have retinopathy. Diabetic, giving then a frequency of 82% which means that for every 100 diabetic people who consult in the ophthalmology clinic, 82 have diabetic retinopathy. 39% presented normal weight and an evolution of diabetes from 10 to 16 years, all the patients treated with diabetic retinopathy at the La Selva Ophthalmology Clinic in the months of January to December 2019 have had type 2 diabetes, most of them do not refer kin precedents. Simultaneously insist on a multidisciplinary performance of both endocrinologists and other subspecialties with the ophthalmological part because these patients, by not being able to do their occupations freely, will lead to socioeconomic restrictions and with it the endless circle of the malfunction of their pathology by lacking of the means for your procedure.

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