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PREVALENCE OF VISUAL IMPAIRMENT AMONG DIABETIC PATIENTS IN THE KUMBA URBAN AREA, CAMEROON

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ABSTRACT: The study aimed at determining the prevalence of visual impairment among diabetic patients in the Kumba urban area, South West Region, Cameroon. The descriptive cross-sectional study was hospital -based. Through purposive sampling technique, 84 diabetic patients were selected from three hospitals with Diabetic and Eye Clinics in the Kumba urban area, Cameroon. The participants were taken through visual acuity measurement, ophthalmoscopy, retinoscopy, subjective refraction and slit lamp examinations. Informed consent was signed by the study subjects. Data collected was analyzed using SPSS v. 20. A total of 52.4% were females and 47.6% were males. The total prevalence of visual impairment among diabetics in the area was 17.8% A total of 60.0% of the visually impaired were females and 40.0% being males ($p<0.05$, 95% CI).The prevalence of ocular conditions among the visually impaired diabetics was 43.3% for cataract, 23.3% for diabetic retinopathy (DR), 16.7% for glaucoma, 13.4% for refractive error and 3.3% for other ocular conditions. This study revealed that the prevalence of visual impairment among diabetic patients in the Kumba urban area, Cameroon was 17.8%. Cataract was the leading ocular condition with 43.3%, present in the visually impaired participants of this study.

KEYWORDS: Visual impairment, diabetic patients, prevalence, Eye Clinics, Kumba Cameroon.

1 INTRODUCTION

Diabetes mellitus is one of the most common chronic diseases in nearly all countries, and continues to increase in numbers and significance, as economic development and urbanization lead to changing lifestyles characterized by reduced physical activity, and increased obesity [1].

Diabetes is one of the major health and development challenges of the 21st century. There are currently 371 million people living with diabetes and another 280 million are at high risk of developing the disease. Half a billion people are expected to be living with diabetes by 2030[2].It is a multi - organ disease and affects many parts of the body, including the eye, leading to visual impairment and blindness [3,4]. Visual Impairment is defined as presenting visual acuity worse than 6/18 in the better eye, with the best refractive correction and/or with a visual field of less than 10 degree from the point of fixation [5,6]. Vitale *et al.,*(2006) reveals that persons with diabetes are more likely to be visually impaired than persons without the disease [7].

Among the population of Jordanian diabetics, out of 986 diabetic patients examined, the prevalence of blindness among participants was found to be 7.4%, while 10.1% were visually impaired [8]. This is a high prevalence of visual impairment among diabetics.

WHO (2007) states in a research conducted that alarmingly, 32% of patients with diabetes at high risk for vision loss never underwent an eye examination, and less than 40% of those with high-risk characteristics for vision loss receive treatment. When examined, almost 61% of these patients were found to have diabetic retinopathy, cataract, glaucoma or other ocular manifestation of diabetes mellitus. These researches show that some diabetic patients were unaware of the complications of this condition hence do not attend the hospital for management [9].

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Therefore our aim in this study was to determine the Prevalence of visual impairment among diabetic patients in the Kumba Urban Area, Cameroon. Moreover this project would serve as a pilot project to inform further research in this area. The outcome of this work would among others provide the opportunity for regular eye examination for diabetic patients. This could result in early detection and management of associated ocular complications with diabetes hence reducing the gravity of visual impairment in diabetics both nationally and internationally.

2 METHODOLOGY

This is a descriptive cross- sectional hospital - based study of 84 diabetic subjects aged 30 to 84 years in Kumba urban area, using Purposive Sampling technique. Questionnaires were administered to each diabetic patient by the research team. Statistical Product and Service Solutions, SPSS (originally known as Statistical Package for Social Science) version 20 was used to analyze the data. The ethical approval was obtained from the Regional delegation of Public Health, Buea, Cameroon. Informed consent was obtained from all study participants before enrolment into the study. All information taken from participants was kept confidential.

3 RESULTS AND DISCUSSION

A total of 84 diabetic patients from three hospitals in the Kumba Urban Area, Cameroon were examined for the study of which 52.4% were females and 47.6% were males. The age range was 30 to 84 years and the mean age was 56.65 years with standard deviation of ± 12.63 and modal age range was 51- 60 years (Table 1).

Table 1 - Age and Gender Distribution of Diabetic Patients

Age Range (Years)	Gender		Total (%)
	Male	Female	
30-40	5	5	10 (11.9)
41-50	6	13	19 (22.6)
51-60	11	10	21 (25.0)
61-70	10	13	23 (27.4)
71-84	8	3	11 (13.1)
Total	40	44	84 (100)

In line with the WHO definition of blindness, using the Standard Snellen Visual Acuity (VA) Chart, the prevalence of diabetics with visual impairment (<6/18 to 6/60) was 17.8%, severe visual impairment (<6/60 to 3/60) was 1.2%, blind(<3/60 to NPL) was 3.6%. The prevalence of normal vision (6/6 to 6/18) was 77.4% ($p<0.05$, 95% CI) (Table 2). The total number of diabetic patients with normal vision (77.4%) is far higher than those with visual impairment (17.8%), severe visual impairment (1.2%) and blindness (3.6%) put together. It is very important to note that the prevalence of the visually impaired of 17.8% among diabetic patients in the Kumba urban area, South Wes t Region, Cameroon is not very high and it is similar to that of a study conducted in the University of Nsukka Teaching hospital (UN TH), Enugu , Enugu state, South-Eastern Nigeria, where 15.4% had visual impairment (23 out of 149 diabetic patients examined)[10].These patients are assumed to be those whose conditions are well under control since they attend the diabetic clinics monthly as in the case of patients in the Kumba urban area.

If the prevalence of visual impairment among these patients is 17.8%, then there could be a higher probability of visual impairment among undiagnosed diabetics and those who do not comply with their treatment. Hence the need to create more awareness among diabetic patients by all stakeholders about the high risks of becoming visually impaired due to ocular manifestation of DM but more dangerously poorly controlled and poor management of diabetes, as well as lack of routine eye check or examination.

Table 2- Prevalence of visual impairment among diabetics

Class of Vision	Standard Snellen VA	Frequency	Percentage (%)
Normal Vision	6/6 to 6/18	65	77.4
Visual impairment	<6/18 to 6/60	15	17.8
Severe Visual Impairment	<6/60 to 3/60	1	1.2
Blind	<3/60 to NPL	3	3.6
	Total	84	100

Among the 15 (17.8%) diabetics from the three hospitals in the Kumba urban area with visual impairment, 43.3% had cataract, 23.3% had diabetic retinopathy (DR), 16.7% had glaucoma, 13.4% had refractive error, 3.3% had other ocular conditions apart from the ones listed above. Hence, the ocular condition with the highest prevalence in diabetic patients who are visually impaired in the Kumba urban area is cataract ($p< 0.05$). Globally, uncorrected refractive errors are the main cause of visual impairment; cataracts remain the leading cause of blindness in middle- and low- income countries [11]. The incidence of cataract could have risk factors such as increasing exposure to UV radiations from the sun, especially in Africa, where Kumba urban area in Cameroon is found. Nonetheless, diabetes being a major risk factor for the development of cataract in diabetics cannot be underestimated [12]. This explains the reason why cataract was found to be the ocular condition with the highest prevalence among diabetic patients with visual impairment in the Kumba urban area. It should also be noted that the participants of this study that are visually impaired and have cataract, could not have cataract as a result of diabetes but probably due to the diabetics living in Africa where there is a high exposure to UV radiation from the sun.

Out of the 17.8% of diabetic patients from this study who are visually impaired, there was an increase in visual impairment with an increase in age from 0% in the 30 - 40 years range to 40.0% in 61- 70 years range, then finally a drop to 13.3% in the 71- 84 years range (Table 3). This is in line with what Resnikoff *et al.,* (2004) stated; that visual impairment is unequally distributed across age groups, being largely confined to adults 50 years of age and older. With respect to gender, 60.0% were females and 40.0% were males. From the above results, t he high percentage of visual impairment in females than males can be attributed to the fact that most of the study participants were females and or the prevalence of visual impairment among diabetic patients, is higher in females than in males.

Table 3- Age and Gender distribution of the visually impaired diabetic patients

Age Range (Years)	Gender		Total (%)
	Male	Female	
30-40	0	0	0 (0)
41-50	1	1	2 (13.3)
51-60	2	3	5 (33.4)
61-70	2	4	6 (40.0)
71-84	1	1	2 (13.3)
Total (%)	6 (40)	9 (60)	15 (100)

Resnikoff *et al.,* (2004) stated that the imbalance distribution in the prevalence of visual impairment with respect to gender is found worldwide, with females having a significantly higher risk of visual impairment than males [13] (Table 3).

From the total population of 84 diabetics who participated in this study in the Kumba urban area, Cameroon, 59.5% were not aware that diabetes could result to ocular complications, which could eventually lead to visual impairment and blindness, whereas 40.5 % were aware of the risk of developing ocular complications due to diabetes. Those that are unaware about the effect of diabetes to the eye are more than those who are aware of its effect to the eye. In terms of duration of DM, in the participants, 48.8% had had diabetes for less than three years, 25% had diabetes for between 4- 6 years, 13.1% had the disease for between 7- 9 years,4.8% had it for between 10- 13years and 8.3% had it for 14years and above ($p<0.05$). With respect to visit to Eye clinics, 78.6% had visited an Eye clinic before while 21.4% had never been to one. Although a higher percentage of the diabetics had been to an Eye clinic, 59.5% are unaware of the effect diabetes has on the eye. In addition, there is a general decrease in the number of diabetics with increase in the duration of the disease. This is demonstrated in Tables 4 and 5 below. This could be due to loss of lives as a result to lack of knowledge and awareness, as well as unawares of the signs and symptom of the disease [14]. About a quarter of the patients (21.4%) had never been to the Eye Clinic for their

eyes to be examined and possibly educated about the effect of diabetes on their vision. There is therefore a high probability of reduced awareness among diabetics who do not visit the hospital. From Table 4, it is clearly illustrated that those who recently had the disease turn to visit the eye clinic more than those who had had the disease for a longer duration.

This could be due to death of diabetics with longer duration of the disease or apathy on the part of the patients resulting from several routine eye checkups.

Table 4-Duration of diabetes and patients visit to Eye Clinic

Duration of diabetes(years)	Patients visit to Eye Clinic		Total (%)
	Yes	No	
0-3	27	14	41(48.8)
4-6	19	2	21(25.0)
7-9	11	0	11(13.1)
10-13	3	1	4(4.8)
14 and above	6	1	7(8.3)
Total/Percentage	66 (78.6%)	18 (21.4%)	84 (100%)

The very high level of unawareness (59.5%) of diabetic patients in the Kumba urban area, Cameroon on the effect of diabetes to their sight and the possibility of it causing visual impairment and blindness to diabetics, is very alarming. Hence the need for all stakeholders and policy makers to get on board for an intensive awareness creation and education to the general public about this disease and its effect in the eye that could lead to very serious ocular complications.

Table 5-Duration of diabetes and patients awareness of its effect to the eye

Duration of diabetes(years)	Awareness of effect of diabetes to the eye		Total (%)
	Yes	No	
0-3	10	31	41(48.8)
4-6	11	10	21(25.0)
7-9	8	3	11(13.1)
10-13	2	2	4(4.8)
14 and above	3	4	7(8.3)
Total/Percentage	34 (40.5%)	50 (59.5%)	84 (100%)

4 CONCLUSION

This study reveals that the prevalence of visual impairment among diabetic patients in the Kumba urban area, Cameroon was 17.8 %. More females were visually impaired than males while cataract was t he leading ocular condition with 43.3%, present in the visually impaired participants of this study. Diabetic retinopathy follows with 23.3%, then glaucoma with 16.7%, refractive error was 13.4% and other ocular condition was 3.3%. The age range of 61- 70 years, had the highest prevalence of visual impairment. From the total study population, although a higher percentage of the diabetics (78.6%) had been to an Eye clinic, a very high percentage of 59.5%, were unaware about the fact that diabetes has an effect on the eye that could lead to ocular complications and subsequently visual impairment and blindness.

The risk of getting ocular complications due to diabetes can be cut down by proper control of blood sugar levels and management of the disease. In addition, the risk of ocular complications that could result to visual impairment and blindness in diabetics can also be reduced by regular eye examination. Most importantly, patients' compliance to the necessary treatment is very significant in reducing the occurrence of visual impairment amongst them. Awareness creation and education of the effect of diabetes on the sight of the patients, the risk of developing visual impairment, as well as the importance of controlling blood sugar levels, will go a long way in encouraging compliance among diabetic patients [15].

5 LIMITATIONS

It was very difficult getting participants for this study since there was no diabetic association, nor a helpful platform to get the patients in the Kumba urban area. This study took place only in hospitals that have both a diabetic clinic and Eye unit.

There could also be many who are diabetic staying in the urban area but are not even aware they have the disease, hence they do not attend any of these clinics.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this paper.

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