International Journal of Medical Science and Pharmaceutical Research

ISSN(e): 3050-5720
ISSN(p): 3050-5712

Vol. 01(02): 35-44, July 2024

Home Page: https://ijmspr.org/index.php/ijmspr

Prevalence of Retinopathies Among the Inhabitants of Aba Metropolis in Abia State 2023

Eberendu, I.F.[1], Okpe, M.C.[2], Obianozie, T.I.[3]
[1,2,3]Department of Public Health, Imo State University Owerri

KEYWORDS: prevalence, retinopathies, inhabitants, Abia state

Corresponding Author:
Eberendu,I.F, Okpe, M.C.

ABSTRACT

A disorder of the retinal vessels called retinalopathy causes an irregular blood floor. It is a prevalent cause of blindness that can be prevented and cannot be reversed. The purpose of this study was to ascertain the incidence of retinopathies among Aba Metropolis residents in Abia State in 2023. A cross-sectional study design based on population was used in the investigation. There were 200 participants in the sample who agreed to participate in the eye test. Pie charts, bar charts, and tables were used to display the data. The data were presented using descriptive statistics, namely using percentages and frequencies. The null hypothesis was tested using inferential statistics using chi-square ($P < 0.05$). For the analysis, IBM-SPSS VERSION 25 was utilised. The findings indicated that 43% of people in Aba Metropolis, Abia State, have retinopathies. Based on kind, the prevalence was found to be 31.4% for hypertensive retinopathy and 68.6% for diabetic retinopathy. Other retinopathies in the region were not discovered by the study. The age group with the highest prevalence, 64.1%, was 71 years and older. While the list was displayed by age group 41 to 50 (23%). It was found that retinopathy was more common among retirees (75.1%) and artisans (18.8%) based on occupation. In terms of sex, it was discovered that females (45.4%) had slightly greater levels than males (40.8%). In conclusion, it is advised that people with hypertension and diabetes check their eyes frequently to prevent this issue.

INTRODUCTION

Any damage to the retina of the eye that has the potential to impair vision is known as retinalopathy. Retinal vascular disorders or changes brought on by irregular blood flow are other names for it. Put another way, retinopathy happens when the retina is not working properly. One of the most frequent causes of avoidable blindness is retinopathy. It could happen as a result of harm to the blood vessels that supply the retina, a light-sensitive blood vessel in the rear of the eye [1].This is so because nerve cells in the retina, a single layer of tissue, carry information that the optic nerve uses to interpret images.

The retina is equipped with sensory membranes that transform light into nerve signals that are transmitted to the brain's visual cortex, where they are used to create images [2].

The term "retinopathy" refers to a broad range of conditions that can cause vision loss connected to the retina. One major factor is the blood flow to the retina. Blood vessels allow the retina to receive the nutrients and oxygen it needs to operate normally. When retinopathy is present, the blood vessels are damaged and may leak, encircle, or grow through the retina, eventually causing it to break down and, in certain situations, resulting in blindness or loss of vision [3].

Retinopathy affects a wide range of individuals. It is anticipated that by 2050, the number of Americans with diabetes who suffer from diabetic retinopathy would rise to around 15 million [4]. These are signs of retinopathy: visual blur, an abrupt shower of black floaters (black or grey strings or flecks) in your field of vision. If their retinopathies are not treated, adult children and middle-aged people with them—particularly those with diabetic and hypertensive retinopathies—are generally more likely to become blind [5].

It is certainly true that a sizable section of the population sees a doctor seldom and may not be aware of their health status with reference to diabetes and hypertension. Many of individuals may be having trouble reading, thus they frequently visit eye clinics. By conducting diabetes and hypertension screenings, eye care professionals may contribute to the community. This is a crucial function because both conditions can cause retinopathy, which can result in irreversible blindness and considerable visual impairment [6].

Less than two million of the approximately 45 million Nigerians who have diabetes have knowledge of their condition, and less than 0.4% of them have their diabetes under control. Epidemiological surveys have been conducted for a number of medical conditions, such as hypertensive and diabetic retinopathies. Patients with diabetes and hypertension currently have a clearly rising incidence of retinopathy and other ocular problems [7].

Retinopathies have social and economic ramifications. Irreversible blindness may result from the development of Retinopathy, which is caused by uncontrolled blood pressure and blood sugar. The individual thus turns into a liability, both to society and to himself. This has led to a significant investment of financial and other resources in rehabilitation and therapy.

MATERIAL AND METHODS

STUDY DESIGN:

This study adopted a cross – Sectional Study Design

STUDY POPULATION:

The population of this study is the population of Aba Metropolis comprising of osisiomaNgwa Local Government Area (322,300 people) and Aba North Local Government Area (155,600 People). The total population is 477,900 people living in Aba.

SAMPLE SIZE

Using Taro Yamane formula $n = \frac{N}{1 + N(e)^2}$ where e = 0.05

$$n = \frac{477,900}{1 + 477,900\ (0.05)^2}$$

$$= \frac{477,900}{1195.75}$$

= 399.67 approximately 400 subjects

According to the calculation the sample size is 400 subjects but 200 subjects who made themselves available during the medical outreaches were used.

RESEARCH INSTRUMENT

Snellen chart for distant and near visual acuity
Pentorch
Ophthalmoscope
Sphygmomanometer
Stethoscope
Glucometer

VITAL SIGNS WERE CHECKED:

Blood pressure
Weight
Temperature
Respiration
Pulse

The fasting blood sugar (FBS) was conducted by the laboratory scientist with the use of Glucometer and the result was recorded in Mg/dl.

CASE HISTORY

In the cause of case history, questions were asked to know about the family history of the patient whether there is history of diabetes and hypertension in the family. They werealso asked whether they are on treatment, the type of treatment, is it with herbal drugs, or on self medication or are they taking treatment from a hospital and a qualified doctor?

After taking the case history, the visual acuity will be taken to know those that have normal visual acuity and those whose vision are reduced. Then external examination of the eye and ocular adnexa will be done using pentorch. This will help to know the pupillary reaction and size.

Ophthalmoscopy was done to assess the fundus for:
Size and Shape
Margin of the disc (for sharpness and clarity)
Normal Physiological cupping
Pigmentation or any other irregularities,
The Blood Vessels Were Checked For:
Diameter of vein to artery
Axial streaking of arteries
No pulsation of arteries
Course of the blood vessels
The fundal background was observed for:
Sharp Macular Reflex
Exudates
Edema
Other Maculopathies

VALIDITY OF INSTRUMENTS

I used snellen acuity chart to measure the visual acuity of the patients. Snellen acuity chart was invented in 1862 by a Dutch Ophthalmologist named Hermen Snellen. It is universally used and it is very reliable.

Heine ophthalmoscope was used to view the fundus. It was made in Germany, it is widely used and very reliable.

Accoson sphygmomanometer was used to measure the blood pressure. It is an aneroid blood pressure device manufactured in United Kingdom. It is universally used and very reliable

Kris AloyStethoscope made in United Kingdom was used to measure blood Pressure. It is a universally used instrument and very reliable.

Accu-check Glucometer was used with the strip to measure the blood sugar level of the subjects. It is made in India and it is 100% reliable.

STATISTICAL ANALYSIS

Data analysis was performed in IBM-SPSS Statistics version 25. Microsoft Excel 2016 was used in drawing charts. Descriptive analysis was used to describe the data. Frequency distributions were constructed with the data and were expressed as the percentage of the distribution. For continuous variables, the summary statistics such as the mean and the standard deviations were computer. Inferential test were performed using Chi-square test, to test for association between retinopathy occurrence and the factors of age sex and occupation. All statistical test were performed at 5% significant level and probability value (P) was used to interpret significance so that any P less than 0.05 was considered significant.

RESULTS

Characteristics of the Study Group

Table 4.1: Characteristics of the Study Group: Age, Sex and Occupation (2023)

Characteristics	Frequency	Percent (%)
Age (in Years): mean = 63.36 st.dev=12.42 Min=20, max = 89		
Less than 41	5	2.5
41 – 50	23	11.5
51 – 60	54	27.0
61 – 70	54	27.0
71+	64	32.0
Total	200	100.0
Sex		
Male	103	51.5
Female	97	48.5
Total	200	100.0

Occupation		
Artisan	16	8.0
Civil / Public service	31	15.5
Driving	15	7.5
Farming	21	10.5
Clergy	6	3.0
Retiree	29	14.5
Nil / Student	3	1.5

Trading/ Business 79 39.5 Total 200 100.0

There were in all 200 people whose data was used for the study and the characteristics of the study group in respect to age, sex and occupation is presented on table 4.1. The average age studied is 63.5 years at a standard deviation (st.dev) of 12.4 years. The oldest person in the group is 89 years while the youngest person is 20 years of age. The table shows that the largest frequency is on the age group 71 years and above (64: 32%), followed by the 61 -70 years and the 41-50 years old at 54 (27%) each. The least among them was observed at the less than 41 years old with only 5 (2.5%) contained in the group.

The distribution for sex classifications indicates that the males were 103 (51.5%) in all while the females were 97 (48.5%).. in terms of occupation, the largest frequency was obtained in trading or private businesses, with a total of 79 (49.5%). Next to that was those engaged in civil or public service with a total of 31 (15.5%), and then the retirees which recorded a total of 29 (14.5%). The students and the unemployed were just 3 (1.5%) while 6 (3.0%) were clergy.

4.2 Occurrence of Retinopathy

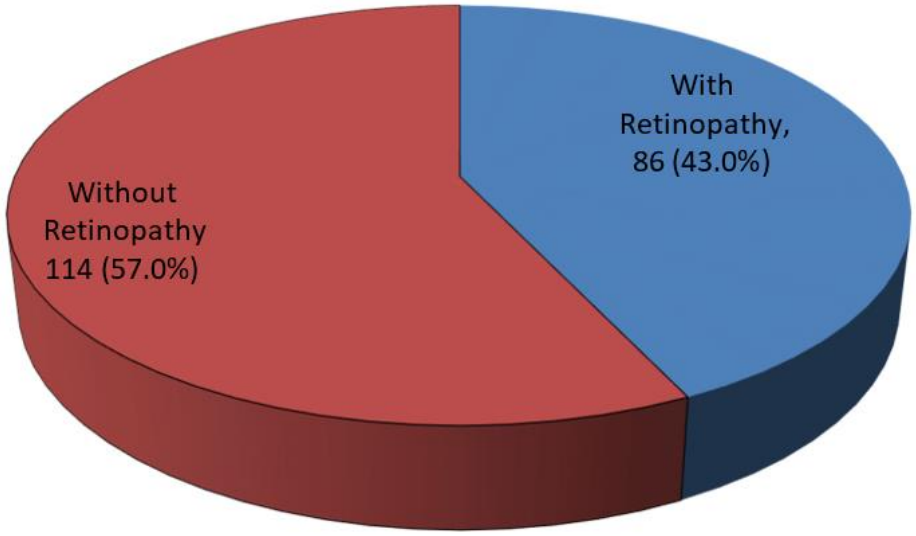

Figure 4.1: Occurrence of Retinopathy among the study group (2023)

The overall rate of occurrence of retinopathy is represented on figure 4.1. it shows that for the study group of 200 people for the period 2023, there were 114 (57%) without retinopathy and the remaining 86 (43%) were with retinopathy, indicating that the rate of retinopathy occurrence was found to be 43% among the study group.

The occurrence rate for hypertensive and diabetic retinopathies were 13.5% (27) for hypertensive retinopathy and 29.5% foe diabetic Retinopathy (Table 4.2).

Table 4.2: Occurrence Rate for Hypertensive and Diabetic Retinopathies (2023)

Retinopathy Type	Frequency	Percent (%)
Hypertensive Retinopathy (n=200)	27	13.5
Diabetic Retinopathy (n=200)	59	29.5

Distribution on Types of Retinopathy Occurred

Table 4.3: Retinopathy Types occurred among the study group (2023)

Retinopathy Type	Frequency	Percent (%)
Hypertensive Retinopathy	27	31.4
Diabetic Retinopathy	59	68.6
Central Serous Retinopathy	-	-
Retinopathy of Prematurity	-	-
Total	86	100

The distribution for the types of retinopathy that occurred among those found with the disease within the study group is represented in table 4.3. it clearly shows that only two types of retinopathy occurred among the group found with retinopathy disease within the period 2023. Diabetic retinopathy occurred most within the study period at a distribution frequency of 59 (68.6%), followed by hypertensive retinopathy at frequency 27 (31.4%)
.None recorded central serous retinopathy or retinopathy of prematurity.

4.4 Distribution for Retinopathy and Age

Table 4.4: Distribution for Retinopathy and Age

Age Class	Total	Retinopathy: Present		Retinopathy: Absent		Chi square χ^2, P	(d.f)
		number	%	number	%		
Less than 41	5	0	0.0	5	100		
41 – 50	23	3	13.0	20	87.0		
51 – 60	54	13	24.1	41	75.9		
61 – 70	54	29	53.7	25	46.3		
71+	64	41	64.1	23	35.9		
Total	200	86	43.0	114	57.0	0.000 34.19 (4) 1	

The distribution for retinopathy and age among the study group (2023) is presented in table 4.4. Significant association was found between retinopathy and age in this study (P=0.0001, χ^2=34.19, d.f =4). The table shows that retinopathy occurrence increases with age. The presence of retinopathy was highest among the oldest age group of 71 years and above (41: 64.1%), followed by the rate of the disease occurrence among the 60 70 years (29: 53.7%) and among the 51 -60 years (13: 24.1%). None of the less than 41 years of age recorded retinopathy.

Figure 4.2 shows that 48.2 percent of those with hypertensive retinopathy were 61-70 years and 44.4% were 71 years and above. For diabetic retinopathy, 49.2% of those with the disease were the above 70 years old and the 60 – 70 years old were 27.1%. none of the less than 41 years old were among the subjects with either hypertensive retinopathy or diabetic retinopathy.

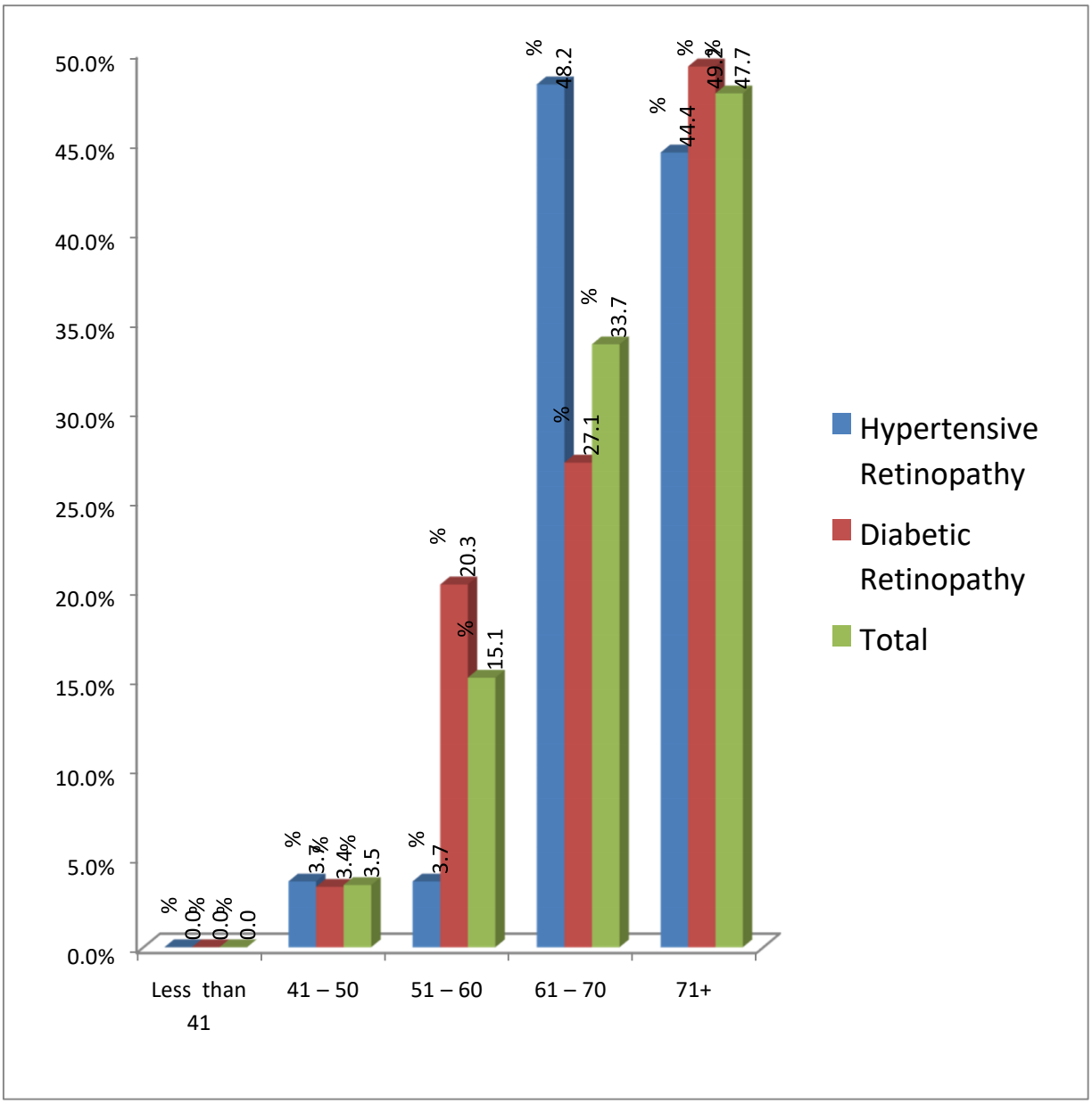

Figure 4.2: Age distribution for hypertensive and diabetic retinopathy among those with retinopathy disease (2023)

Retinopathy and Sex

Table 4.5: Distribution for Retinopathy and Sex

Sex	Total	Retinopathy: Present numb er	%	Retinopathy: Absent numb er	%	Chi square (d.f)	P
Male	103	42	40.8	61	59.2		
Female	97	44	45.4	53	54.6		
Total	200	86	43.0	114	57.0	0.428 (1)	0.513

In Table 4.5, the distribution for Retinopathy and sexshows that the presence of retinopathy was found to be slightly higher among females at 44 (45.4%) compared to the rate of occurrence at 42 (40.8%) found among males. However, sex was not evidently established as a significant association factor of retinopathy in this study (P= 0.513, χ^2= 0.428, d.f =1), hence the slight difference in distribution between male and female is likely to have occurred by chance. In figure 4.3, hypertensive retinopathy occurred more on females than on males while diabetic retinopathy occurred more on males than it occurred on females. Thus, up to 70.4% of those with hypertensive retinopathy were females against 29.6% for males, while
57.6% of those that have diabetic retinopathy were males compared to 43.4% for females

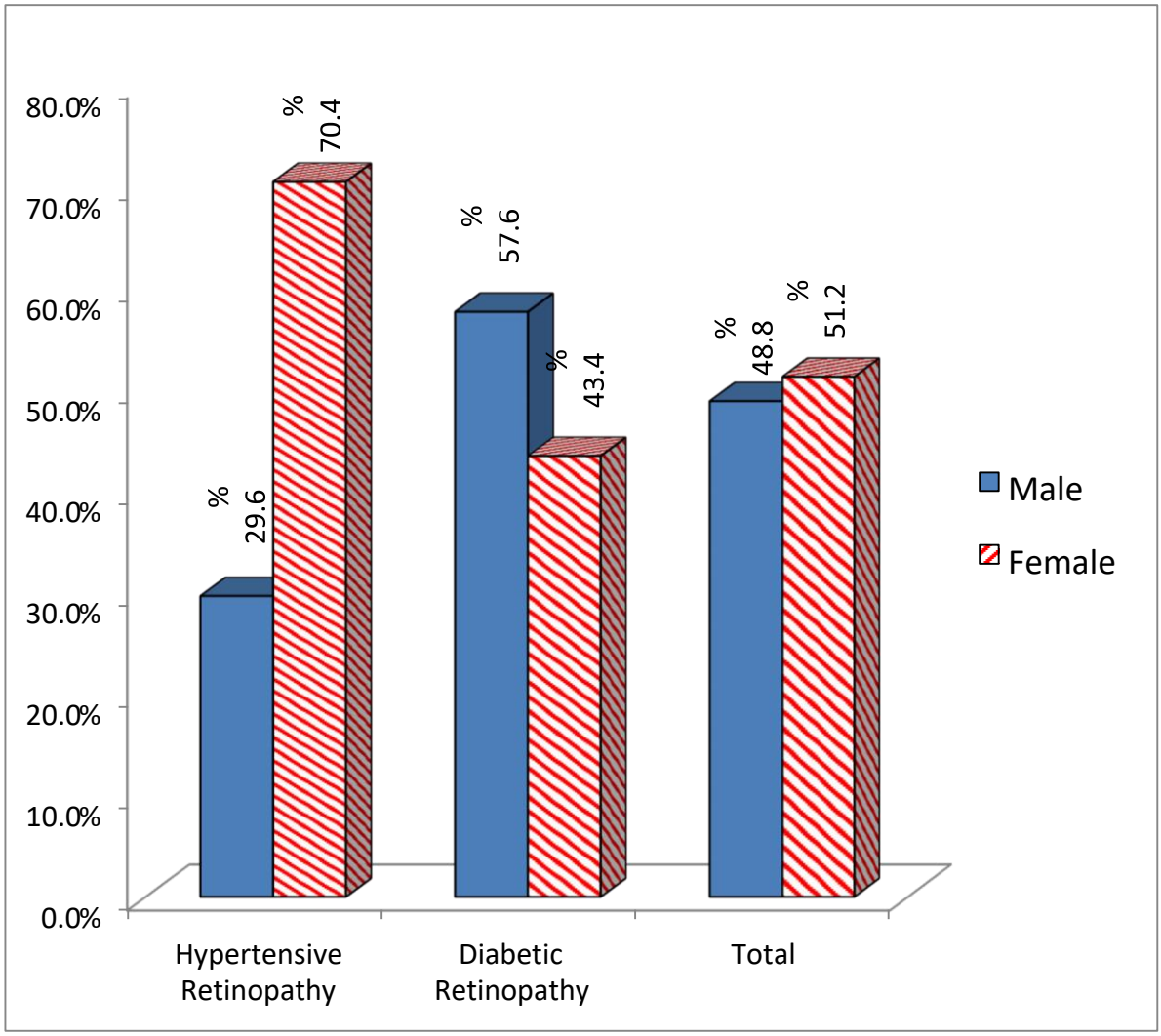

Figure 4.3: Sex distribution for hypertensive and diabetic retinopathy among those with retinopathy disease (2023)

Retinopathy and Occupation

The distribution for retinopathy and occupation among the study group (2023) is represented in table 4.6. The table shows that significant association was found between retinopathy and occupation among the study group(P=0.0001, χ^2 =28.54, d.f =7). The rate of occurrence of retinopathy was quite high among the retirees (75.9%) and also among the drivers (66.7%). Among the traders or those in business, the presence of retinopathy disease within the study period was found to be 44.3%. It was found lowest among the artisans (18.8%) followed by the rate among those engaged in civil or public service (22.6%).

Table 4.6: Distribution for Retinopathy and Occupation

Occupation Number	Total Present %	Retinopathy Absent %	Retinopathy (d.f)	Chi	-square	P
Artisan	16	3	18.8	13	81.3	
Civil / Public service	31	7	22.6	24	77.4	
Driving	15	10	66.7	5	33.3	
Farming	21	6	28.6	15	71.4	
Clergy	6	2	33.3	4	66.7	
Retiree	29	22	75.9	7	24.1	
Nil / Student	3	1	33.3	2	66.7	
Trading/ Business	79	35	44.3	44	55.7	
Total	200	86	43.0	114	57.0	28.54 0.00
(7) 01^{LR}						

Figure 4.4 shows that none of the artisan recorded hypertensive retinopathy while none of the students or the unemployed had diabetes retinopathy. However many of those whose occupation were trading and businesses recorded large proportion of both hypertensive retinopath (29.6%) and diabetes retinopathy (45.8%), this could be due to the fact that many of the study group are involved in trading/ business. The retirees were also higher in bother diseases (33.3% among hypertensive retinopathy group and 22% among diabetes retinopathy group).

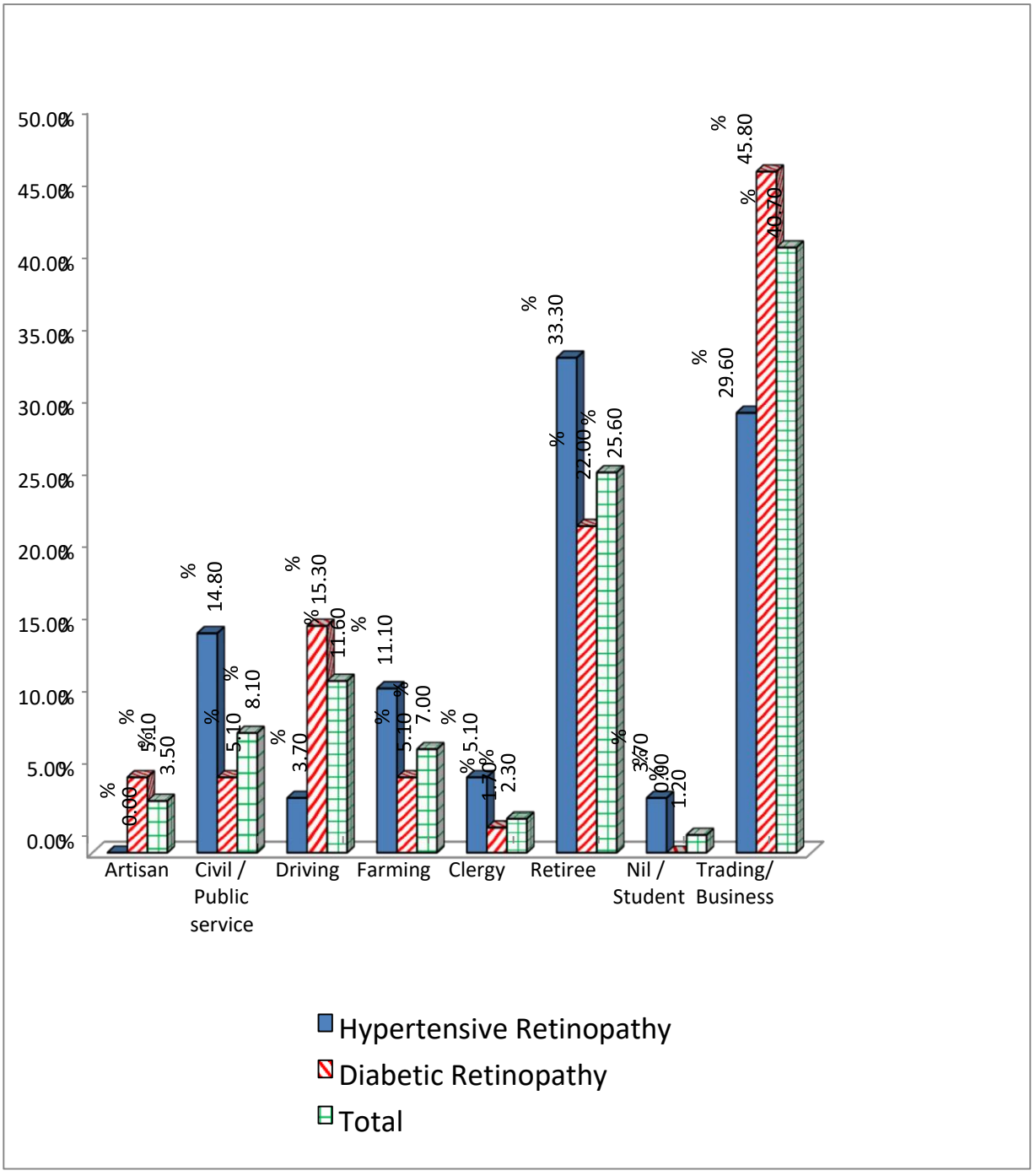

Figure 4.4: Occupational distribution for hypertensive and diabetic

retinopathy among those with retinopathy disease (2023)

DISCUSSION

The purpose of the current study was to investigate the prevalence of retinopathy in residents of Aba, Abia State. Evidently, the investigation discovered that 43% of the study area had retinopathy overall (2023). Taking into account the detrimental effects of retinopathy on world health, this incidence was remarkably high. One possible explanation for the high disease occurrence rate could be the age distribution of the study sample, which included no participants under 40.
It was evident from the distribution of retinal types that occurred over the study period that only two types—diabetic retinopathy

and hypertensive retinopathy—occurred within the group fgroup. During the study period, diabetic retinopathy predominated, followed by hypertensive retinopathy.

In a research conducted in Ibadan, Nigeria, diabetic retinopathy was also shown to be the most frequent condition [8]. In one of the present research, both hypertensive retinopathy and diabetic retinopathy were found as prevalent retinal conditions [9]. Hypertensive retinopathy (41.8%) and diabetic retinopathy (37.9%) were the most common types of retinopathy in a research done elsewhere in the Democratic Republic of the Congo [10]. The results of this study contradict those of other studies that found age-related macular degeneration (AMD) to be the most prevalent form of retinopathy [11].The elevated frequency of AMD in those studies, however, is probably due to the increasing incidence of risk factors such diabetes and hypertension [12].

In the current study, the incidence of hypertensive retinopathy was determined to be 13.5%, but the incidence of diabetic retinopathy was 29.5%. The total pooled rate of 21.3% (95% confidence interval 21.1–21.5) obtained in an ameta analysis of studies conducted in Nigeria [13] was lower than the rate associated with diabetic retinopathy. It was less than the 42% previously recorded among diabetes patients in a Nigerian tertiary hospital [14] and the 43.33% discovered in a Benin research [15]. However, the rate of hypertensive retinopathy in this study was roughly double that of a study conducted in a rural area of Imo state, which revealed the rate to be 6.6% [16].

The disparity in results between the two studies may be explained by the fact that the study's data came from hospitals, where it is customary for rates to be higher because most patients are there because they are ill or experiencing symptoms of a disease. The study discovered a strong correlation between age distribution and retinopathy, with no one under 41 having either hypertensive or diabetic retinopathy. Considering that over half of the study group was over 60, this result is obviously not surprising. Age is a known determinant in the occurrence of retinopathy, with older age groups having a higher chance of developing the condition.

This conclusion is consistent with the findings of some other studies [17], but it differs from the outcome in [18], which was unable to prove that age was a significant risk factor for retinopathy ($p = 0.621$). The discrepancies in these studies' sample sizes may account for these variances in results.

The distribution of retinopathy and sex in the index study indicates that the prevalence of retinopathy was found to be somewhat greater in females than in males. In contrast to diabetic retinopathy, which affected more men than women, hypertensive retinopathy affected more women than men. The change may have happened by accident, though, as sex was not clearly shown to be a significant associated factor of retinopathy in this investigation.

Gender was not shown to be a significant risk factor for diabetic retinopathy ($p = 0.958$) in [19], which is consistent with this finding.

The distribution of retinal and occupation among the study group reveals a considerable correlation between the two, with retinopathy and occupation being shown to occur at a high prevalence among drivers and retirees alike. In line with this discovery, occupation has also been shown to have a major impact on retinopathy, with retirees having higher odds [20]. While none of the students or unemployed individuals had diabetes retinopathy, none of the artisans had hypertensive retinopathy. One possible explanation could be that the prevalence of diabetes and hypertension is typically lower in young people, who make up the majority of students and job searchers.This consistently lowers the group's rate of retinal disease. Young people make up a large portion of the artisan workforce, and the nature of their work can aid in their weight loss and blood sugar regulation.

CONCLUSION

Retinopathy occurs at a very high rate. In the research area, hypertension retinopathy and diabetic retinopathy are common retinopathies. Risk variables for both diabetes and hypertensive retinopathy, such as age and occupation, were clearly significant predictors of their occurrence.

REFERENCES

1. Onakpoya, O.H., Doña, P., & Awe, O.O. (2020) The burden of visual impairment and blindness from vitreoretinal diseases: A Nigerian tertiary hospital retina unit experience. Niger Med Journal; 61:257-61
2. Azeez TA, Adediran OA, Eguzozie EC, Ekhaiyeme E. (2021). Prevalence and risk factors for diabetic retinopathy in Nigeria: A systematic review and meta-analysis. Pan Am J Ophthalmol; 3:17.
3. Burgess, P.I., MacCormick, I.J.C., Harding, S.P., Bastawrous, A., Beare, N.A.V. and Garner, P. (2013), Epidemiology of diabetic retinopathy and maculopathy in Africa: a systematic review. Diabetic Medicine, 30: 399-412.
4. Wong, T.Y. and Mitchell, P. (2004). Retinopathy. New England Journal of Medicine, 2310 – 2317.
5. Zeiter, J., Shin, D. (1994). Craefes Arch of Clinical Experimental Ophthalmology. 205 – 210.
6. Byun SH, Ma SH, Jun JK, Jung KW, Park B (2013) Screening for Diabetic Retinopathy and Nephropathy in Patients with Diabetes: A Nationwide Survey in Korea. PLOS ONE 8(5): e62991.
7. Hode, A. , Abouki, C. , Dedjan, A. , Djossou, A. , Aïgbe, N. , Djohossou, G. , Alamou, S. , Odoulami, L., Sounouvou, I. &Tchabi, S. (2023) Risks Factors Associated with Diabetic Retinopathy at the National University Hospital Center Hubert KoutoukouMaga in Cotonou. Journal of Diabetes Mellitus,13, 23-35. doi:

8. Ashaye, A., Arije, A., Kuti, M., Olusanya, B., Ayeni, E., Fasanmade, A., Akinlade, K., Obajimi, M., &Adeleye, J. (2008). Retinopathy among type 2 diabetic patients seen at a tertiary hospital in Nigeria: a preliminary report. Clinical ophthalmology 2(1), 103– 108.
9. Rabiu, M.M., Taryam, M.O., Muhammad, N., Oladigbolu, K., Abdurahman, H. (2020). Prevalence of diabetes mellitus and diabetic retinopathy in persons 50 Years and above in Katsina state Nigeria: a populationbased cross-sectional survey. Ophthalmic Epidemiol. 27(5): 384-389
10. Uhumwangho, O.M. and Itina, E.I. (2015). Retinal diseases in a tertiary hospital in southern Nigeria. Journal of West Africa CollegeSurg.2015; 5(2):1–16.
11. Rita, O. Ewuga, R.O., Adenuga, O.O., Wade, P.O., Edah, J.O. (2018). Prevalence and risk factors for diabetic retinopathy in north-central Nigeria. Ghana Medical Journal; 52 (4). 77-81
12. 12.Torpy, J.M., Glass, T.J., Glass, R.M. (2007). Retinopathy. JAMA, 298(8):944.
13. Kabedi, N. N., Kayembe, D. L., &Mwanza, J. C. (2020). Profile of retinal diseases in adult patients attending two major eye clinics in Kinshasa, the Democratic Republic of Congo. International journal of ophthalmology, 13(10),1652–1659.
14. Ajayi, I.A., Motoye, O,J,, Ajite, K.O., Ajogbasile, O.O. (2016). Retinal disorders in a tertiary eye centre in Nigeria. Pak J Ophthalmol.;32(3):152–158.
15. Ibrahim, O.A., Foster, A., Oluleye, T.S. (2015). Barriers to an effective diabetic retinopathy service in Ibadan, Nigeria (sub-Saharan Africa)– A pilot qualitative study. Ann Ib Postgrad Med;13:36-43.
16. Nkanga, D., Adenuga, O., Okonkwo, O., Ovienria, W., Ibanga, A., Agweye, C., Oyekunle, I., Akanbi, T., (2020). Profile, Visual Presentation and Burden of Retinal Diseases Seen in Ophthalmic Clinics in Sub-Saharan Africa. Clinical ophthalmology (Auckland, N.Z.), 14, 679–687.
17. Sohn EH, van Dijk HW, Jiao C, Kok PH, Jeong W, Demirkaya N, (2016) Retinal neurodegeneration may precede microvascular changes characteristic of diabetic retinopathy in diabetes mellitus. *Proc Natl Acad Sci U.S.A.* 113(19):E2655–64.
18. Simó R, Hernández C(2012) . Neurodegeneration is an early event in diabetic retinopathy: Therapeutic implications. *Br J Ophthalmol* 96(10):1285–90.
19. Wang B, Wang F, Zhang Y, Zhao SH, Zhao WJ, Yan SL, (2015) Effects of RAS inhibitors on diabetic retinopathy: A systematic review and meta-analysis. *Lancet Diabetes Endocrinol* (2015) 3(4):263–74
20. Schreur V, van Asten F, Ng H, Weeda J, Groenewoud JMM, Tack CJ, (2018) Risk factors for development and progression of diabetic retinopathy in Dutch patients with type 1 diabetes mellitus. *Acta Ophthalmol* 96(5):459–64.