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Prevalence of diabetic retinopathy in urban and rural population in Eastern Uttar Pradesh

Ram Kumar[1,*], Rajesh Kumar[2]

[1]Professor & HOD, [2]Senior Resident, Dept. of Ophthalmology, BRD Medical College, Gorakhpur, Uttar Pradesh

***Corresponding Author:**
Email: ramkumarjaiswal35@yahoo.com

Abstract

Introduction: Diabetes mellitus (DM) is an important public health concern, globally there is a rising trend in the prevalence of DM due to many factors such as aging, urbanization and increasing obesity and physical inactivity. The international diabetes federation (IDF) predicts that the prevalence of DM in South East Asia will increase by two folds by the years of 2025.(1) This increase would be approximately 42%. Today in India diabetic retinopathy is 6th cause of blindness. A person with diabetes is 25 times more likely to become blind than a person of General population.(2)

Materials and Methods: Cross sectional study done over a period of one year of every diabetic patient coming in our OPD and Registration of every diabetic patient attended in our camps.

Result: The study has been carried out on 1500 patients out of which 486 patients were found have diabetic mellitus. The male female ratio was be found nearly 1:1 (56%) male and (46%) female there was significant distribution in sex.

Simultaneously we found 39 (26%) male out of 148 male patients and 24 (19%) female out of 126 female patients in urban area who had diabetic retinopathy.

Likewise we also found we found 24 (21%) male out of 114 male patients and 15 (15%) female out of 98 female patients in rural area who had diabetic retinopathy.

Introduction

Diabetes mellitus (DM) is an important public health concern,

Globally there is a rising trend in the prevalence of DM due to aging, urbanization obesity and physical inactivity.

The international diabetes federation (IDF) predicts that the prevalence of DM in South East Asia will increase by two folds by the years of 2025.(1)

This increase would be approximately 42%. In developed countries and maximum increase in expected in India.

Today in India diabetic retinopathy is 6th cause of blindness. A person with diabetes is 25 times more likely become blind than a person in of General population.(2) Diabetic retinopathy is a highly specific vascular complication of both type 1 and type 2 diabetes. The prevalence of retinopathy is strongly related to the duration of diabetes. After a duration of 20 years of diabetes, nearly all patients with type 1 diabetes and >6o% of patients with type 2 diabetes develop some degree of retinopathy. Diabetic retinopathy poses a serious threat to vision. In the Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR), 3.6% of younger-onset patients (aged years at diagnosis, an operational definition of type 1 diabetes) and 1, 6% of older-onset patients (aged years at diagnosis, an operational definition of type 2 diabetes) were legally blind. In the younger- onset group, 86% of blindness was attributable to diabetic retinopathy. In the older-onset group, where other eye diseases were common, one-third, of the cases of legal blindness were due to diabetic retinopathy. Overall, diabetic retinopathy is estimated to be the most frequent cause of new cases of blindness among adults aged 20-74 years.(4,5) To study proportion of Diabetic Retinopathy in Urban and Rural Population in western Uttar Pradesh.

Objective

To assess the risk factors of development of Diabetic Retinopathy in case of urban Diabetic Patients and rural Diabetic Patients.

Materials and Methods

The Study has been carried out on the patients coming in the OPD of Dept. of ophthalmology & camps conducted by Dept. of ophthalmology, NEHRU Hospital, BRD Medical College, Gorakhpur.

Urban patients are patients who came to our Department from urban areas of Meerut.

Rural patients are patients who came to our department from rural areas and rural camps attended by us.

Study Design; Cross sectional study done over a period of one year of every diabetic patient coming in our OPD and Registration of every diabetic patient attended in our camps.

Inclusion Criteria:

- Known patient of Diabetes Mellitus.
- Family history of Diabetic Mellitus.
- Patient with -RBS value >200 ml/dl

HbA1c >6.5%

Fasting blood sugar >126 mg/dl

- Fundus finding suggestive of diabetic retinopathy

Exclusion Criteria

- Uveitis
- History of Trauma
- Media hazy due to any causes like e.g. Corneal Opacity, Significant Cataract
- Any other retinal disease other than diabetic

Selection of patient: All the patients who satisfied the inclusion criteria underwent complete ophthalmic evaluation.

Evaluation of patients and Work Plan: The patient attending the Eye OPD and Camps were examined according to protocol and standardized format developed for the purpose

A proper consent was obtained and patients were selected after assessment of:

- Detailed history of diabetic symptoms (Polyuria, polyphagia, polydypsia, fatigability).
- Family history was also taken accordingly.
- History of risk factors for diabetic retinopathy- duration of diabetes, hypertention, pregnancy and neuropathy.
- Other associated systemic disease like cardiovascular, respiratory, central nervous and renal system.
- Particulars i.e. Name, age, sex, occupation, address of the patient

Visual acuity: UCVA and BCVA by Snellen's chart.

Applanation tonometry: To record the intra ocular pressure

Slit lamp examination for complete ocular examination.

1. conjunctiva
2. cornea
3. ant chamber- for content and depth
4. iris
5. pupil
6. lens

Fundus examination: Both direct and indirect ophthalmoscopy and slit lamp biomicroscopy with 90D was done after dilatation of pupils with tropicamide and phenylepherine if patient was not hypertensive. If the patient was hypertensive plain tropicamide eyedrops will be used. The following points were taken into consideration:

Media clarity, size of disc, colour of disc, margin of disc, cup: disc ratio, arterio-venous ratio, foveal reflex, peripheral retina for haemmorhage, microaneurysm, hard exudates, intraretinal microvascular abnormalities (IRMA), macular edema and neovascolarisation.

Special Investigations:

Systemic evaluation-Heart Rate, Blood Pressure, Pulse, Respiratory Rate

Blood Sugar: RBS

: Fasting

: HbA1c

Clinical photograph was taken for patient.

In The Study we examined a total of 1500 patient and sorted out a total of 486 patients who had Diabetes mellitus.

Observation and Results

Table 1: Sex distribution of patients with diabetic mellitus

Sex	Number	Percentage
Male	262	53.02%
Female	224	46.09%
Total	486	100%

During our survey 1500 patients attended our clinic and rural camp out of which 486 had diabetic mellitus among them 53% (262) were male while 46% (224) were female. The male female ratio is 1:1.

Table 2: Area wise Distribution of diabetic mellitus patients

Area	Number	Percentage
Urban	274	56.04%
Rural	212	43.06%
Total	486	100%

Area wise Distribution of diabetic mellitus 486 patients, 274 (56.04%) were urban while 212 (43.06%) were rural patients.

Table 3: Prevalence of diabetic retinopathy in patients with diabetic mellitus

Type of patients	Number	Percentage
DM	486	100%
DR	102	21%

The above table shows 102 (21%) patients with diabetic mellitus had diabetic retinopathy.

Table 4: Prevalence of diabetic retinopathy in rural and urban patients with diabetic mellitus

Type of patients	No. of DR patients	No. of DM patients	Percentage
Urban	63	274	23%
Rural	39	212	18.4%

In our study we found that prevalence of diabetic retinopathy was 23% among urban diabetic mellitus patients while in was 18.4% in rural diabetics' mellitus patients.

Table 5: Sex distribution of urban diabetic mellitus patients and diabetic retinopathy patients

Sex	No. of DM patients	No. of DR patients
Male	148	39 (26%)
Female	126	24 (19%)

Above table showing 39 (26%) male were retinopathy patients out of 148 and 24 (19%) females were diabetic retinopathy out of 126 patients.

Table 6: Sex distribution rural diabetic mellitus and diabetic retinopathy patients

Sex	No. of DM patients	No. of DR patients
Male	114	24 (21.02%)
Female	98	15 (15.03%)

Above table showing 24 (21.02%) male were retinopathy patients out of 114 and 15 (15.03%) females were diabetic retinopathy out of 98 patients.

Table 7: Association of diabetic retinopathy with smoking

Type of patients	DR		Total no.	P value
	Yes	No		
Smoker	81 (26.6%)	223 (73.04%)	304	0.00
Non smoker	21 (11.5%)	161 (88.5%)	182	

Out of 486 patients who had DM, 304 patients were smoker and 182 patient's non smoker. Out of 304 patients who were smoker we found that 81 (26.6%) patients had DR, whereas in 182 patients who were non smoker 21 (11.5%) developed DR.

After comparing the above data with chi-square test, it was found that there was significant role of smoking in DR ($p = 0.00$).

Table 8: Association of diabetic retinopathy with Hypertension

Type of patients	DR		Total no.	P value
	Yes	No		
Hypertensive	85 (30.4%)	195 (69.6%)	280	0.00
Non Hypertensive	17 (8.3%)	189 (91.9%)	206	

On analysing the above table we found that 486 patients who had DM, 280 patients were hypertensive and 206 patient's non hypertensive. Out of 280 patients who had hypertension 85 (30.4%) patients had DR, whereas in 206 patients who were non hypertensive 17 (8.3%) developed DR.

On applying statistics, it was found that it was found that there was significant association of hypertension in development of DR ($p = 0.00$).

Discussion

Field Survey Analysis: In our study during of period of one year in rural camps and our OPD we surveyed around 1500 patients, diabetes were found in 486 patients which is 32.4% of the population, in this total 486 patients around 56.04% patients i.e. 274 pts are urban and 212 pts i.e. 43.06 %pts were rural patients and we found 102 (21%) patients had diabetic retinopathy.

We also found the sex distribution of urban diabetic patients and that 54.88% urban male pts diabetic while 45.98% female were diabetic, in rural population this ratio nearly same i.e. 53.77% rural male were diabetic while 46.22% rural female were diabetic.

We found nearly 21% out of 486 diabetic pts were had diabetic retinopathy and 23 urban i.e. 63 pts and 18.4% rural pts i.e. 39 pts having diabetic retinopathy respectively. So total 102 pts out of 486 were found with diabetic retinopathy. In which 26% urban male and 21.02% rural male were has diabetic retinopathy and 19% urban females 15.03% rural females were had diabetic retinopathy respectively.

So total 972 eyes of 486 pts were examine and 180 eyes were found with diabetic retinopathy changes.

Visual acuity record suggests that there occurs reduction in the best corrected visual acuity of the patients with diabetes though maximum patients in our study having 10 yrs of diabetes are between 6/18 - 6/60 of snellens test types.

A study UKPDS on 1919 patients with diabetic mellitus showed that incidence of retinopathy with patients baseline systolic blood pressure ≥ 140 mmHg were 2.8 times (95%) confidence interval as likely to develop retinopathy as compared to patients with systolic blood pressure ≤ 125 mmHg mercury.[22]

In Wisconsin epidemiologic study of diabetic retinopathy (WESDR), diastolic blood pressure was found to be a significant prediction of progression of diabetic retinopathy to proliferative diabetic retinopathy.[23]

A study done by Gitlow JT, JM, on hypertension and diabetic retinopathy so that hypertension and diabetic mellitus is common multiple risk factor of microvascular and macrovascular complication.[24]

In our study we found that 486 patients who had DM, 207 patients had Hypercholestremia and 278 patients were without Hypercholestremia. Out of 207 patients who had Hypercholestremia 83 (41%) patients had DR, whereas in 278 patients who were without Hypercholestremia 19 (6.8%) developed DR.

Another study done by Lavasson LI, Alan and Lither shows that association of Hypercholestremia with retinopathy in patients aged 15-50 year country Sweden studied 285 patients of type-1 diabetic mellitus were in they found statistically significant association between higher level of total serum cholesterol, decreasing HDL / total cholesterol levels with more severe diabetic retinopathy.[25]

A study carried by Pushlata Agroia Rajeev Philip et al on association of serum lipid with diabetic retinopathy in type-2 diabetic mellitus patients carried on total 140 patients showing a significant correlation

of high serum lipid level with severity of diabetic retinopathy.[26]

Table show distribution of patients in different age category in which maximum number of patients with age above 50 years showing development of more diabetic retinopathy it was significant (p = 0.003).

Out of 486 patients who had DM, 304 patients were smoker and 182 patient's non smoker. Out of 304 patients who were smoker we found that 81 (26.6%) patients had DR, whereas in 182 patients who were non smoker 21 (11.5%) developed DR.

Conclusion

The study has been carried out on 1500 patients out of which 486 patients were found have diabetic mellitus. The male female ratio was be found nearly 1:1 (56%) male and (46%) female there was significant distribution in sex.

Simultaneously we found 39 (26%) male out of 148 male patients and 24 (19%) female out of 126 female patients in urban area who had diabetic retinopathy.

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Show be conclude that in urban population more diabetic mellitus and diabetic retinopathy patients found due to awareness and easy availability medical facility and early diagnosis while in urban population number of diabetic mellitus and retinopathy patients are less due to unavailability of hospital and medical facility and may be due to their active physical life.

In our study we found the urban population comprised 56.04% of the total 486 diabetic mellitus patients whereas rural population comprised 43.06% showing that there was a greater prevalence of diabetic retinopathy in urban population.

The prevalence of diabetic retinopathy in 486 patients with diabetic mellitus was found to be 21% (102) patients.

In our study with association of diabetic retinopathy with risk factor we found that total 81 (26%) out of 304 smoker patients had diabetic retinopathy and it is significant (p = 0.000) and also we found hypertension and hyperlipedimia in significant correlation (p = 0.000).

Patents with hypertension having diabetic retinopathy are 85 (30.4%) and patients with hyperlipidemia are 83 (41%) with significant (p = 0.000).

We also found that patients in different age category in which maximum number of patients with age above 50 years showing development of more diabetic retinopathy it was significant (p = 0.003). So we conclude that patients with higher aged had more change to develop diabetic retinopathy.

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