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Prevalence and Awareness of Diabetic Retinopathy in Diabetes Patients Attending Ayurveda Hospital, Kirtipur

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Abstract

Diabetic retinopathy understood in Ayurveda as Madhumehajanya Timira disorder arising from Prameha (diabetes) is the most prevalent micro vascular complication associated with diabetes mellitus and leading cause of blindness. The main objective of the study was to find the awareness of diabetic retinopathy and blindness due to diabetic retinopathy among diabetes patients visiting Ayurveda Hospital Kirtipur. It is survey study, patients diagnosed with diabetes were included for study and interview questionnaires were used to collect data from November 2020 to December 2020. Approximately one third of the respondents were in the late middle age to early old age group. More than sixty percentage were male patients than the females. Three- fifth had attained education up to the school level, and thirty eight percent identified as Brahmins. Nearly all respondents were under medication for diabetes mellitus, with nearly fifty percent having taken medication for more than ten years. More than three- fifth of the participants were aware of diabetic retinopathy and more than fifty percent reported attending regular checkups. More than one- half of respondents were aware of Diabetes mellitus may cause for blindness and more than one - third were not aware about untreated Diabetes mellitus may cause blindness in future. More than one - half had received information through doctors during hospital visit about Diabetic retinopathy blindness. Mostly fifty percent had history of Diabetic Retinopathy for six month and nearly two- fifth had history for 1-2 years. There was a relationship observed between diabetic retinopathy and the duration of diabetes mellitus, with a p-value of 0.09. Although this does not meet the conventional threshold for statistical significance ($p < 0.05$), it suggests a potential association that may warrant further investigation.

***Keywords**:* Madhumehajanya timira, prameha, diabetes mellitus, diabetic retinopathy, blindness, awareness

Introduction

Diabetic retinopathy (DR), understood in Ayurveda as *Madhumehajanya Timira* disorder arising from *Prameha* (diabetes), is a microvascular disorder of the retina associated with prolonged uncontrolled hyperglycemia (Sahoo et al, 2017). Diabetic retinopathy (*Madhumehajanya Timira*)) is the most prevalent microvascular complication associated with diabetes mellitus (*Prameha*) and the leading cause of blindness. However, diabetic retinopathy can remain asymptomatic until considerable vision impairment occurs. In both its early and advanced stages, diabetic retinopathy may not present noticeable symptoms; the global prevalence of diabetes mellitus (DM) continues to rise in both developed and developing nations (Rani, et al, 2008)

There are approximately 280 million individuals living with diabetes worldwide, and this number is projected to double by 2025 (Rathmann et al, 2004), making it a significant public health concern (Ginsberg et al, 2010). In the United States, diabetes mellitus (*Prameha*) is the primary cause of blindness among working-age adults between 20 and 64 years old (Klein, 2007). It is estimated that over 30 million people in the U.S. have diabetes, with 28.5% showing signs of diabetes retinopathy (*Madhuemehajanya Timira*) and 44% experiencing vision-threatening retinopathy. (Zhang, et al, 2010 & *National Diabetes Statistics Report, 2020).* Diabetes mellitus (*Prameha)* is a major global contributor to blindness due to its associated ocular complications (Tumosa, 2008). A prior study conducted in Australia assessing awareness of diabetes- related complications revealed that only 37% of individuals with diabetes recognized the connection between the condition and eye diseases (Livingston, 1998). Approximately 589 million adults (aged 20–79) were living with diabetes globally and projections indicate that this number could rise to **853 million by 2050 (**International Diabetes Federation, 2025). About 60% of the world's diabetic cases would be in the Asia-Pacific region, aligning with the statement in Hong Kong Med J that over 30% would be concentrated there. (Zimmet, et al, 2016)

Diabetic retinopathy (*Madhumehajanya Timira*) is recognized as a leading cause of vision impairment among working age individuals and those aged 55 years and older (Mohamed, et al; 2007) and (Bunce, et al; 2006). A pilot study in Pakistan estimated the prevalence of diabetic retinopathy to be around 26%, with a significant rise to 66.1% among individuals aged 51 and above (Khan AJ, et al; 1991). Diabetic retinopathy is categorized into two forms: non-proliferative and proliferative. Consequently, early diagnosis is crucial in preventing vision loss associated with DR. According to the Nepal Diabetes Association, diabetes affects around 15% of individuals aged 20 and older in urban regions (Singh &Bhattarai, 2003). Research indicates that diabetic retinopathy is present in approximately 19-47% of diabetic patients in Nepal (Thapa, et al, 2013 and Shrestha, 2011). The American Diabetes Association and the American Academy of Ophthalmology have established guidelines recommending dilated retinal exams. For individuals with type

1 diabetes mellitus, annual eye screenings should commence five years after the initial diagnosis (Singer, et al, 1992).

In Nepal, fewer than 30% of individuals with diabetes (*Prameha*) are aware of diabetic eye disease (Shrestha, et al, 2014). Nearly half of the cases have never undergone a retinal examination, even after living with diabetes for over a decade (Thapa, et al, 2012). Understanding diabetes (*Prameha*) and diabetic retinopathy (*Madhumehajanya Timira*), along with their health consequences and available treatments, is crucial in encouraging patients to seek proper eye care. Many patients do not fully comprehend the seriousness of their diabetic condition. Regular and timely screenings play a crucial role in preventing diabetic retinopathy. Proliferative diabetic retinopathy, a more severe form of the disease, can even lead to blindness (Kohner, et al, 1982). In Nepal, diabetic eye care services are not integrated into overall diabetes management. As a result, individuals with diabetes frequently visit eye care specialists only after developing advanced, sight-threatening diabetic retinopathy (*Madhumehajanya Timira*) (Paudyal, G, et al, 2008). In Nepal, diabetes is becoming increasingly prevalent, yet awareness about diabetic retinopathy remains extremely low. Moreover, early detection and management of Diabetic retinopathy require a thorough understanding of the condition and its associated risk factors (Huang, et al, 2013).

The main objective of this study is to find the awareness of diabetic retinopathy (*Madhumehajanya Timira*) and blindness due to diabetic retinopathy among diabetic (*Prameha*) patients visiting Ayurveda Hospital Kirtipur.

Methods and Materials

It is an observational survey, non-interventional study. The study included 100 random diabetes patients who visited Kirtipur Ayurveda Hospital and had been diagnosed with diabetic mellitus (DM). The duration of the study was from 1st November 2020 to 30th December 2020. The patients between the ages of 35 years to 85 years diagnosed with diabetes were included in the study, and interviewer questionnaires were used to assess the patients' awareness about diabetic retinopathy (DR). The patients who were not willing to go for the interviewer questionnaires were not included in the study. Informed consent was taken from patients before the data collection. A total of 105 Diabetes mellitus patients visited to Ayurveda Hospital OPD between November to December 2020; out of them, 3 patients were above 85 years, and 2 patients were not willing to go for the interviewer questionnaires. So 5 patients were excluded from the and only 100 patients were included for the study. The questionnaires used in the study were prepared after a thorough literature review of the papers relevant to the awareness of diabetic retinopathy (DR).

Demographic characteristics regarding age, gender, education level, and ethnicity of patients were recorded. The questions were designed to observe the awareness about diabetic retinopathy and blindness due to Diabetic retinopathy (DR). Some of the questions were in the format of ‘yes 'or 'no’, while others were multiple-choice questions in which the patients were asked to choose their best response. Patients’ response to questions, along with their demographic data, was entered into SPSS 20.

Discussion and Results

Analysis and interpretation of the data have been organized in the following two ways (frequency and percent), and the chi-square test is applied.

Table 1

Demographic Information of the Respondents. (n=100)

S.N.	Variables	Frequency	Percent (%)
1	Age (year)		
	35-45 46-55 56-65 66-75 75-85	16 27 33 14 10	16 27 33 14 10
2.	Gender		
	Male Female	62 38	62 38
3.	Education Level		
	School level Higher school Bachelors Masters	60 17 15 8	60 17 15 8
4	Ethnicity		
	Brahmin Chettri Janjati Dalit	38 25 29 8	38 25 29 8

Source. Field Survey, 2020

Table 1 shows that out of 100% respondents,16% were between 35-45 years of age, 27% of them were between 45-55 years of age, 33% were between 56-65 years, 14% belonged to the 66-75 years group, and 10% of them were above 75 years. We found 62 % of the respondents were male and 38% female. Regarding their education 60% studied school level, 17% had higher secondary education, 15% graduates and 8% had completed a

master's degree. We found 38% of the population were Brahmin,25% Chettri, 29% Janjati, and 8% of them were Dalit.

Table 2

Evaluation of Duration and Type of Medicine Taken by the Respondents

S.N.	Variables	Frequency	Percent (%)
1	Under Medicine (n=100)		
	Yes	97	97
	No	3	3
2.	Medicine Type (n=97)		
	Allopathic	82	87.6
	Ayurveda	5	5.2
	Combined	7	7.2
3.	Medicine Duration (n=97)		
	Below 1 year	7	7.2
	1-2 years	9	9.3
	3-5 years	25	25.8
	5-10 years	16	16.5
	Above 10 years	40	41.4
4.	Treatment Satisfied(n=97)		
	Yes	90	92.8
	No	7	7.2

Source. Field Survey, 2020

Table 2 shows that out of 100% respondents, 97% were under medication for diabetes mellitus and 3% didn't take any medication. Out of 97 respondents, 87.6% took allopathic and 5.2% took Ayurveda medication. .7.2% was under combined medications. Out of 97 respondents, 7.2% were taking medicines for diabetes mellitus for less than a year. 9.3% respondents were taking medicines for less than two years, and 25.8% were taking medication for three to five years. 16.5% respondents were taking medicines for five to ten years and 41.4% of them were taking medicines for more than a decade.

Table 3

Evaluation of Awareness of DR and Duration of Hospital Visit for Eye Check-up

S.N.	Variables	Frequency	Percent (%)
1	Knowledge about DR (n=100)		
	Yes	70	70
	No	30	30
2.	Regular checkup(n=100)		
	Yes	63	63
	No	37	37
3.	Duration of hospital visit (n=63)		
	Within 6 months	28	44.4
	Within 1 year	15	23.8
	1-2 years	20	31.7

Source. Field Survey. 2020

Table 3 shows that out of 100 respondents, 70% respondents were aware of diabetic retinopathy, and the remaining 30% were unaware of this 63% of respondents visit the hospital regularly, and 37% do not visit the hospital. Out of 63% visiting the hospital regularly, 44.4% go for a checkup every six months, 23.8% visit every year, and the remaining 31.7 % go for a checkup within one to two years.

Table 4

Evaluation of Blindness Awareness Due to DR, Source of Awareness

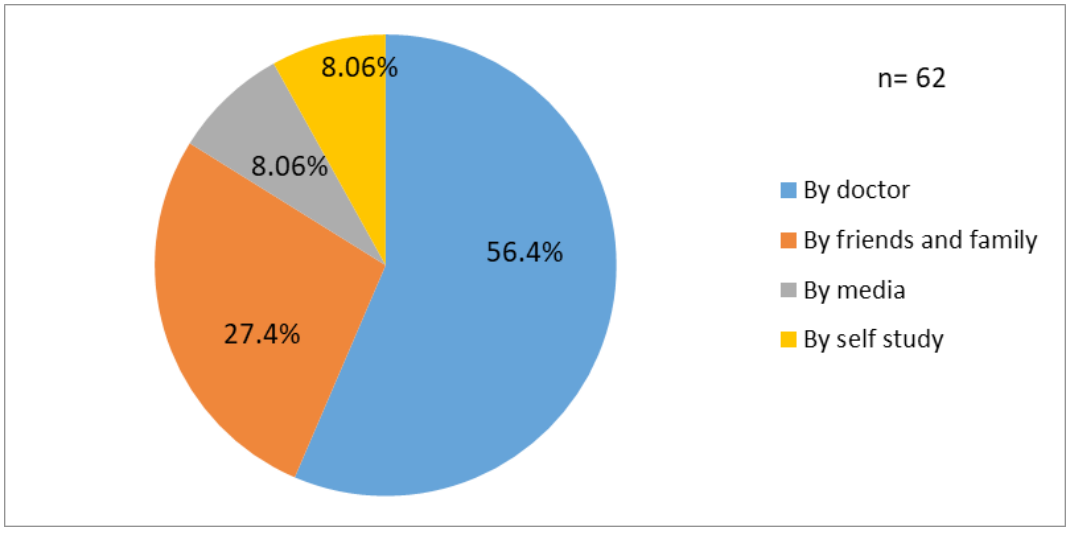
S.N.	Variables	Frequency	Percent (%)
1.	Blindness Awareness (n=100)		
	Yes	62	62
	No	38	38

Source. Field Survey, 2020

Table 4 shows that out of 100 respondents,62 % of respondents are aware of blindness due to diabetes, but 38% are unaware of it.

Figure 1

Evaluation of the Source of Awareness of Blindness Due to DR (n=62)



Out of 62 aware respondents, 56.4% got information from their doctor, 27.4% from their friends and families, 8.06% knew from social media and 8.06% got knowledge from self-study.

Table 5

Evaluation of the Duration of Diabetic Retinopathy

S.N.	Variables	Frequency	Percent (%)
1.	Suffering from DR (n=100)		
	Yes No	8 92	8 92
2.	Duration of DR (n=8)		
	Within 6 months 1-2years 3-5years	4 3 1	50 37.5 12.5

Source: Field Survey, 2020

Table 5 shows that out of 100 respondents, 8% were suffering from diabetic retinopathy and 92 %were not affected by DR. Out of 8 suffering from DR, 50% had been suffering by DR for 6 months, 37.5% were suffering by DR for around two years and 12.5% were suffering by DR for more than 3 years.

Table 6

Correlation of Diabetic Retinopathy and Duration of Diabetic Mellitus

Chi-Square Test			
Pearson chi square	Value	DF	P- Value
	7.88	4	0.09

There was a relationship observed between diabetic retinopathy (DR) and the duration of diabetes mellitus, with a p-value of 0.09. Although this does not meet the conventional threshold for statistical significance ($p < 0.05$), it suggests a potential association that may warrant further investigation.

Table 7

Correlation of Awareness of Diabetic Retinopathy and Awareness of Blindness

Chi-Square Test			
Pearson chi square	**Value**	**DF**	**P- Value**
	55.6	1	0.001

The Pearson Chi Square provides a value of 55.6 with a P value of 0.001. Hence, we have strong evidence to conclude that the relationship between two variables (awareness of diabetic retinopathy and awareness of blindness due to DR) is statistically significant.

This study shows that out of 100 respondents with diabetes mellitus *(Prameha*), 33% of the respondents were between the 56-65 age groups. The majority 62% were male patients than the females, which is similar to the study done by Thapa R, et al, 2012, but opposed to the study done by Shrestha et al, 2007, where males suffering from Diabetes mellitus were more than females. Most of them, 60% had a school level of education, and a few, 15% had graduated from a university. Among the ethnic groups, the majority, 38% of the respondents, were Brahmins, and only 8% were from the Dalit group. This finding is similar to the study done by Thapa R, et al, 2012. Almost all of the respondents 97% were under medication for DM, except for a few, 3% were not taking medicine for Diabetes mellitus. Two-fifths of the respondents, 41.4% were taking medicines for more than ten years of duration which is lower than the study done by Thapa et al, 2012, 2012; one-fifth of them, 25.8% were taking medicines for three to five years. The majority, 87.6% were taking Allopathic medicine; very few, 5.2% were taking Ayurveda medicine. This shows that the majority of patients believe in allopathic medicine for fast recovery. Most of them, 92.8% were satisfied with the treatment of Diabetes mellitus; however, very few, 7.2% were not satisfied with the treatment of Diabetes Mellitus.

Out of 100 respondents of diabetes mellitus (*Prameha*), Majority 70% of respondents knew Diabetic retinopathy (*Madhumehajanya Timira*), which is higher than the findings of

Thapa R, et al, 2014; still, three-tenths, 30% of the respondents were unaware of it. More than half of the individuals 63% went for regular checkups, and 37% of respondents do not go for eye checkups. Mostly 44.4% of them visited the hospital every six months, similarly 23.8% visited the hospital every 1 year, and 31.7% of them visited the hospital within one to two years of a gap. This shows that counseling for Diabetes mellitus patients about diabetic eye disease is needed during hospital visits by patients. The majority, 62% of respondents, were aware that Diabetes mellitus may cause blindness, and 38% were not aware that untreated Diabetes mellitus (*Prameha*) may cause blindness in the future.

Among those who were aware of Diabetic retinopathy (*Madhumehajanya Timira*) blindness, more than 56.4 % had received information through doctors during a hospital visit. Similarly, 27.4% were aware of Diabetic retinopathy blindness through family and friends and media, and self-study played less important role for awareness of Diabetic retinopathy blindness, which is only 8.06%. Which is similar to a study done by Thapa et al, 2012, but unlike the study done by Saikumar et al, 2007, where media was the main source for awareness of diabetic eye disease. Nearly one tenth, 8% of the respondents were suffering from Diabetic retinopathy (*Madhumehajanya Timira*), which is a lower incidence than the findings of the study done by Paudyal, et al, 2019 and the remaining 92% were not suffering from Diabetic retinopathy. Most of 50% had a history of Diabetic retinopathy for six months, and 37.5% had a history of 1-2 years. There was a relationship observed between diabetic retinopathy (*Madhumehajanya Timira*) and the duration of diabetes mellitus (*Prameha*), with a p-value of 0.09. Although this does not meet the conventional threshold for statistical significance ($p < 0.05$), it suggests a potential association that may warrant further investigation, which is similar to a study done by Rizwan et al, 2020. There is a significant relationship between awareness of DR and awareness of blindness DR ($p<0.001$), that is, if they were aware of DR, they would have increased awareness that blindness may occur due to negligence of diabetic retinopathy.

Conclusion

Diabetes mellitus is seen in the early elderly group, and it is seen more in males compared to the female group. This may be because females were more active in household activities. This study depicted that three-fifths of the respondents were aware of diabetic retinopathy (*Madhumehajanya Timira*) and blindness due to Diabetic mellitus. Two-fifths are still unaware, which shows that need to increase awareness through community-based health education initiatives, including door-to-door outreach and general health promotion efforts and provision of access to retinopathy is necessary. Majority of the patients had only school-level education, which was a significant barrier to the awareness of diabetic retinopathy as well chance of blindness if the DR is neglected in diabetic patients. The major source of their awareness about blindness due to diabetic retinopathy was doctors and then followed by friends and family. Nearly one tenth of the respondents were suffering

from DR, yet awareness about diabetic retinopathy and blindness due to DR remains extremely low. Despite the advancement in the health system, we are lagging behind in health awareness in the community, villages, or urban areas.

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