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## INTRODUCTION

Retinopathy due to T1DM is amongst the leading cause of functional disability in the productive age group.<sup>1</sup> Vision disability have been ranked among one of the top 10 disabilities in the world.<sup>2</sup> The frequency of diabetic retinopathy ranging from 19.9% to 49.6%, in different ethnic population.<sup>3</sup> Previous surveys demonstrated varying degrees of retinopathy and its severity.<sup>4</sup> Retinopathy with proliferative progression, labelled as PDR, in type 1 diabetics is more common as compared to T2DM. Longevity, hypertension, poor glycemic control, and genetics are amongst the strong determinants of the proliferative nature of the disease.<sup>5</sup> Duration of the disease in type 1 diabetics is considered as a single most important risk factor for PDR.<sup>6</sup> Epigenetic modification and mutation in genome are also considered as robust determinants for the development and progression of retinopathy.

## RETINAL INVOLVEMENT IN TYPE 1 DIABETICS, AN EXPERIENCE FROM A SPECIALIZED DIABETES CARE UNIT OF KARACHI, PAKISTAN.

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**ABSTRACT... Objectives:** To evaluate frequency of retinopathy in type 1 diabetics. **Study Design:** Retrospective Study. **Setting:** Diabetes Unit (BIDE) of Baqai Medical University (BMU) Hospital of Karachi, Pakistan. **Period:** January 2017 to September 2018. **Material & Methods:** Convenience sampling was done to collect clinical, biochemical, demographic and anthropometric measurements. Ophthalmic screening was performed by funduscopy at a slit lamp biomicroscopy with the help 90 D fundus lens. Modified Early Treatment Diabetic Retinopathy Disease Severity Scale (ETDRS) was used for the categorization. **Results:** Overall retinopathy was observed in around seven percent (7%) participants. On further examination by the ophthalmologist, 2 (5.1%) and 1 (2.3%) cases were grouped into 2 (5.1%) STDR group and 1 (2.6%) into NSTDR group. The frequency of mild to moderate and moderate to severe non proliferative diabetic retinopathy (NPDR) was found in 2.5% cases each. Whereas, tractional retinal detachment TRD and CSME were found in 2.6% cases each. **Conclusion:** This study highlights the importance of screening of retinopathy in type 1 diabetics to avoid insult on.

**Key words:** Fundoscopy, Retinopathy, T1DM.

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The detailed mechanism in this regard is still need to be explored further.<sup>7</sup> Pregnancy is also considered as a precipitating factor.<sup>8</sup> Klein et al in 2010 conducted a population-based study on DR in type 1 diabetics and reported decline in the incidence of retinopathy with proliferation and impaired vision.<sup>9</sup> Mayer-Davis et al, estimated that the prevalence of DR in people with type 1 and type 2 diabetes suffering for more than 5 years was 17% and 42% respectively.<sup>10,11</sup> ISPAD (International Society For Pediatric and Adolescents Diabetes) Guidelines published by International Society For Pediatric and Adolescents Diabetes in 2018 suggested that eye screening is recommended starting from 11 years of age along with 2 to 5 years diabetes duration.<sup>12</sup> Landmark trials showed reduction in the incidence and progression of DR with intensive metabolic and glycemic control.<sup>13,14</sup> This study was planned to assess the frequency

and severity of fundal involvement (retinopathy) in type 1 diabetics.

## MATERIAL & METHODS

Starting from January 2017 to September 2018, this data was analyzed retrospectively. The ophthalmology department of Baqai Institute of Diabetology and Endocrinology Karachi – Pakistan was the site of the study. Ethical approval was obtained from the IRB of the same institution. A pooled from 654 participants with type 1 diabetes were recruited, of which 378 people retinopathy was unchecked due to reason of newly diagnosed type 1, age was <10 years, and their financial issues, while 276 people retinopathy was checked by diabetic consultant. Demographic, clinical parameters and previous history of an eye surgery or laser treatment were retrieved from Hospital Management System (HMS). Every individual irrespective of age group having type 1 DM was included in this study. History of glaucoma, and other pre-existing retinal disease etc, were excluded. Screening was performed through fundoscopy at a slit lamp biomicroscope with the help 90 D fundus lens. Presence of sign of retinopathy was taken as adequate indication to classify the people in retinopathy group. People with normal fundus was referred for follow up and also excluded from the study.

Modified Airlie House Classification grading. Was employed for the staging of diabetic retinopathy. Mild and moderate stage of Non-proliferative DR (NPDR) without (Clinically significant macular edema) CSME was categorized into (Non sight threatening diabetic retinopathy) NSTDR group. As well as (Proliferative DR) PDR, CSME alone or in combination with NPDR or PDR and (Advanced diabetic eye disease) ADED were categorized into (Sight threatening DR) STDR. People with ADED were referred to tertiary care hospital for pars-planaviterctomy. People with severe NPDR without CSME were considered clinically on individual basis and decided either for follow up.

Appropriate statistical analysis was performed to check the significance (T-test and chi-square test). Analysis was done by using SPSS version

20.0. Frequency and percentage were calculated for quantitative variable.

## RESULTS

Almost equal gender distribution is reported in 654 people with type 1 diabetes. Mean age of male was  $22.71 \pm 11.9$  (yrs) and female was  $21.52 \pm 10.84$  (yrs). Overall, body mass index (BMI) and HbA1c levels were  $21.39 \pm 5.17$  (kg/m<sup>2</sup>) and  $9.97 \pm 2.56$  (%), respectively. Median IQR (Interquartile ranges) of people with long duration of diabetes and insulin were 6(2-12) and 5(1-11) respectively. Significant differences were found between males and females in variable such as occupation, height and weight (P value  $\leq 0.05$ ) (Table-I).

The DR was found in 20 (7.3%) participants through fundoscopy (Table-II). On further examination by the ophthalmologist, 2 (5.1%) and 1 (2.3%) cases were grouped into 2 (5.1%) STDR group and 1(2.6%) into NSTDR group. The frequency of mild to moderate and moderate to severe NPDR was found in 1(2.5%) and 1(2.5%) cases, respectively. Whereas, (tractional retinal detachment) TRD was observed 1(2.6%), and CSME 1(2.6%) cases, respectively.

## DISCUSSION

Our findings has shown the frequency DR in people with type 1 diabetics was 7.3% which is similar to frequencies reported in European and Middle East countries comparatively, DR in Portugal was 16.3%, (Spain) 12.3%, and Oman 7.9% respectively.<sup>15,16</sup> Studies reported the co-occurrence of DR and PDR to be higher in type 1 diabetics as compared to type 2 diabetics (almost 2 to 3 fold for any DR while almost ten times for PDR).<sup>17</sup> Moreover, the frequency of DR in Scotland and Wales for type 1 diabetics was 19.3% and 56% respectively.<sup>18,19</sup>

Present study determines the frequency of STDR, ADED (TRD) and NSTDR to be 5.1%, 2.6% and 2.6% respectively.<sup>17</sup> A population based study from China reported STDR of 13.13%<sup>20</sup> which was greater than that reported in Hong Kong (13.13% vs 9.8%), a reason due to a lack of immediate and efficient treatment. Another study suggested

STDR of 6.0% in an organized screening center in Liverpool.<sup>21</sup> Similarly, previous local study shown advance diabetic eye disease (TRD) to be 2% in type 1 diabetics.<sup>22</sup>

This study reported 2.6% of CSME in h type 1 diabetics. Reports from other part of the world demonstrates that 97% type 1 diabetics developed retinopathy after 25 years of disease. Out of which, 42% developed PDR d and 17% CSME were reported.<sup>23,24</sup> While some studies reported early diabetes related complication type 2 diabetics rather than type 1 diabetics.<sup>25</sup>

The study demonstrates a significant burden of DR. Early detection and effective intervention can be employed to prevent its drastic outcomes further larger scale epidemiological studies are required to ascertain the findings of this study.

## CONCLUSION

This study highlights the importance of screening of retinopathy in type 1 diabetics to avoid insult on.

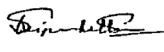
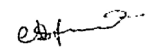
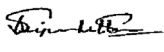

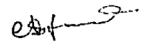
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2	Jai Parkash Panjwani	Interpretation of data, wrote and approved the manuscript.	
3	Abdul Rasheed Khokar	Literature search edited and approved the manuscript.	
4	Anum Butt	Literature search, interpretation of data, wrote, and approved the manuscript.	
5	Asher Fawwad	Concept, design, edited and approved the manuscript.	
6	Abdul Basit	Concept, design, edited and approved the manuscript.	