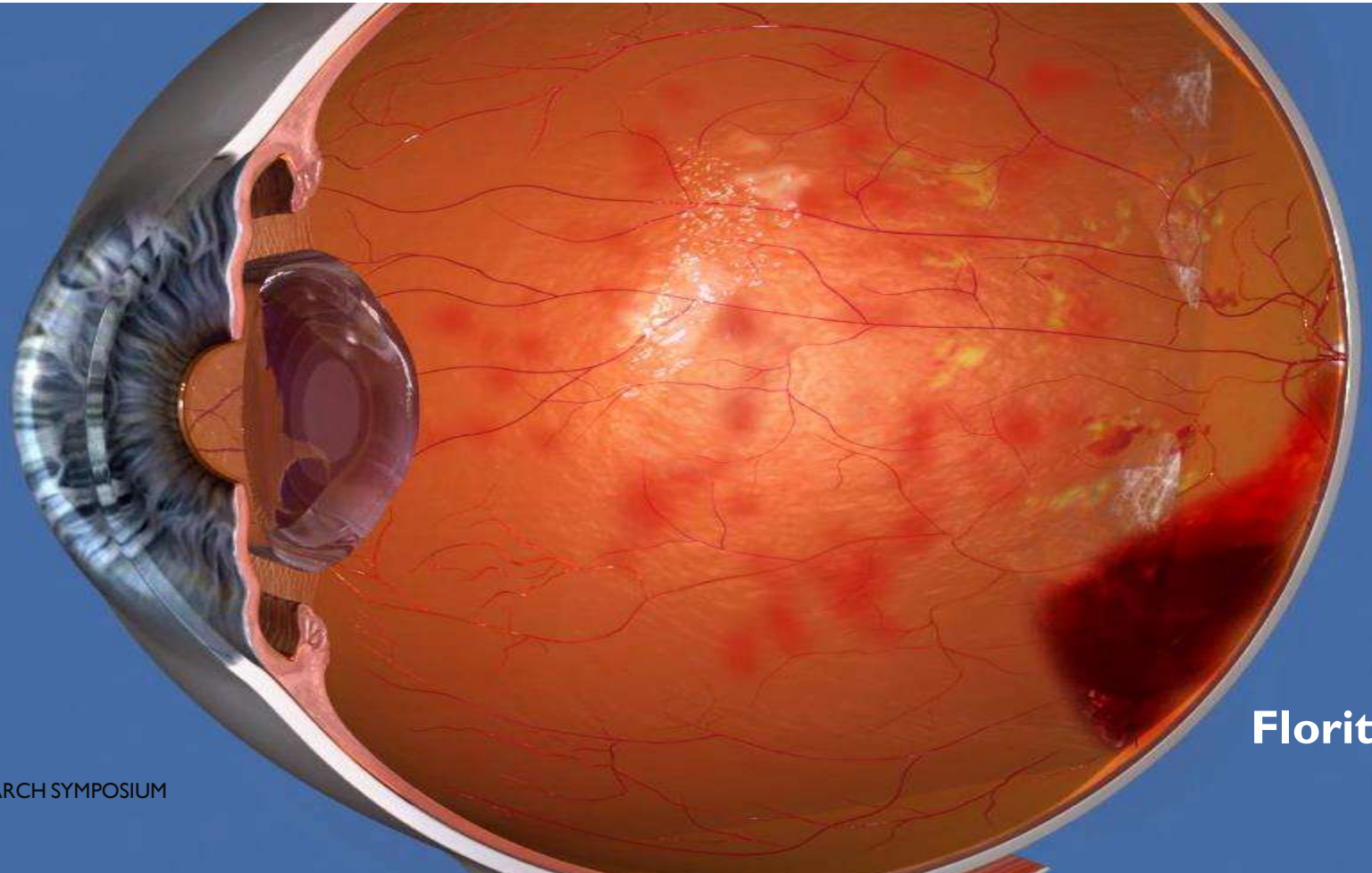
SURVIVAL RATE OF PROLIFERATIVE DIABETIC RETINOPATHY (PDR) PATIENTS UNDERGOING LASER TREATMENT AT PACIFIC EYE INSTITUTE (PEI), SUVA, FIJI, FROM 2012 TO 2017



By
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INTRODUCTION

Why this research is important?

Proliferative diabetic retinopathy (PDR) is**)** is a complication of diabetic retinopathy (DR) characterised by the development of: tiny enlarged blood vessels in the retina of an eye, fibrous growth and vitreous fluids surrounding the retina.

It lowers an individual quality of life but can be corrected using a laser treatment (Pan Retinal Photocoagulation).

Statistics :

Globally : 34.6% DR, 2.6 million visually impaired, *and 17 million PDR.*

Pacific : 52.9% DR in Vanuatu, 69% in Nauru

Fiji ; 15% STDR , blindness 2.7%, Impairment 6.7% , 2020 - more than 550 people registered for DR at PEI diabetic eye clinic

What we know and don't know

PDR was said to be preventable with early detection and treatment. Early retinal screening is said to be effective that reduces the chances of DR and blindness, and laser treatment which is also known as Pan retinal Photocoagulation (PRP). But what is the five years survival rate of PDR patients who underwent laser treatment ? Is there an association between screening and survival time .As PEI is planning to introduce vitreous surgery, who is going to benefit from this surgery?

Observation

New cases of PDR patients who had attended retinal screening a year prior laser treatment and those who attended retinal screening the same year as undertaking their laser treatment (all new PDR cases from 2012-2017)

Hypothesis

Null Hypothesis :There is no association between screening and survival time and screening has no effect on median survival time

Alternate Hypothesis : That screening detects early disease which is easy to cure, which prolongs the median survival time.

Aim : To determine the survival rate in a sample of PDR patients undergoing their first laser treatment from January 2012 to December 2017 at PEI in Suva, Fiji.

Objectives:

1. To describe the demographic characteristics of PDR cases who underwent their first laser treatment at PEI diabetes clinic from the years 2012 to 2017.

2. To estimate the five years trend and proportion of their survival.

3. To estimate the survival time, the probabilities of surviving and the differences of survival rates of PDR cases who underwent retinal screening for at least one year prior to developing PDR and those who attended retinal screening at first visit during the same year of attending first laser treatment.

4. To assess factors associated with the survival time of PDR

5. To identify the current health status of PDR patients in this study.

METHODS

- **Study population -** All new cases of diabetic eye diseases, who had taken first laser treatment between January 2012 to December 2017. total population of 3,282.
- **Study design -** Cross-sectional retrospective study
- **Study setting** - PEI, Suva, Fiji.
- **Primary data source** – Data collected from phone interviews
- **Secondary data source** - PEI Best Practice Software VIP.Net, under PEI diabetic clinic, patient information system (January 2012 to December 2017).
- **Study variables**

Independent Variables	Dependent variables
Age	Survival status
Gender	Vision status
Ethnicity	Current health status
Screening status	

- **Sampling method -** Convenience sampling
- **Sample size -**208 (computed using Epi info)

Methods (cont…)

Data collection tools

- Interview : Closed ended quantitative questionnaire questions modified using the measurement used by IAPB
- Phone script
- Person information sheet
- Consent form
- Data sheet

Reliability & Validity

Data validated for standard data collection without bias.

Pre-test

Phone calls pre-tested for time duration
Questions pre-tested

Analytical methods used

- SPSS version 22 & Microsoft Word Excel

Statistical method used

- Kaplan Meier model,
- Cox Regression Model (Multivariate)
- Log Rank Test.

RESULTS

Demographic characteristics of all new cases of PDR who attended their first laser treatment at PEI from 2012 to 2017, and had participated in the study (n=155)

Demographic	Frequency	Percentage
Gender		
Male	66	43%
Female	89	57%
Ethnicity		
Fijians of Indian Descents	116	74%
Itaukei	28	18%
Others	11	7%
Survival status		
Alive	103	67%
Died	52	33%
Age categories		
27-36	9	6%
37-46	15	10%
47-56	58	37%
57-66	49	32%
67-76	19	12%
77-86	5	3%
Age (years)		
Mean age	55	
Mode	57	
Minimum	27	
Maximum	80	
Mean age at death (years)	63	
Vision Screening status		
One year prior laser treatment	48	31%
Screened same year as laser treatment	107	69%

RESULTS (cont.)- Proportion and trend of survival of PDR

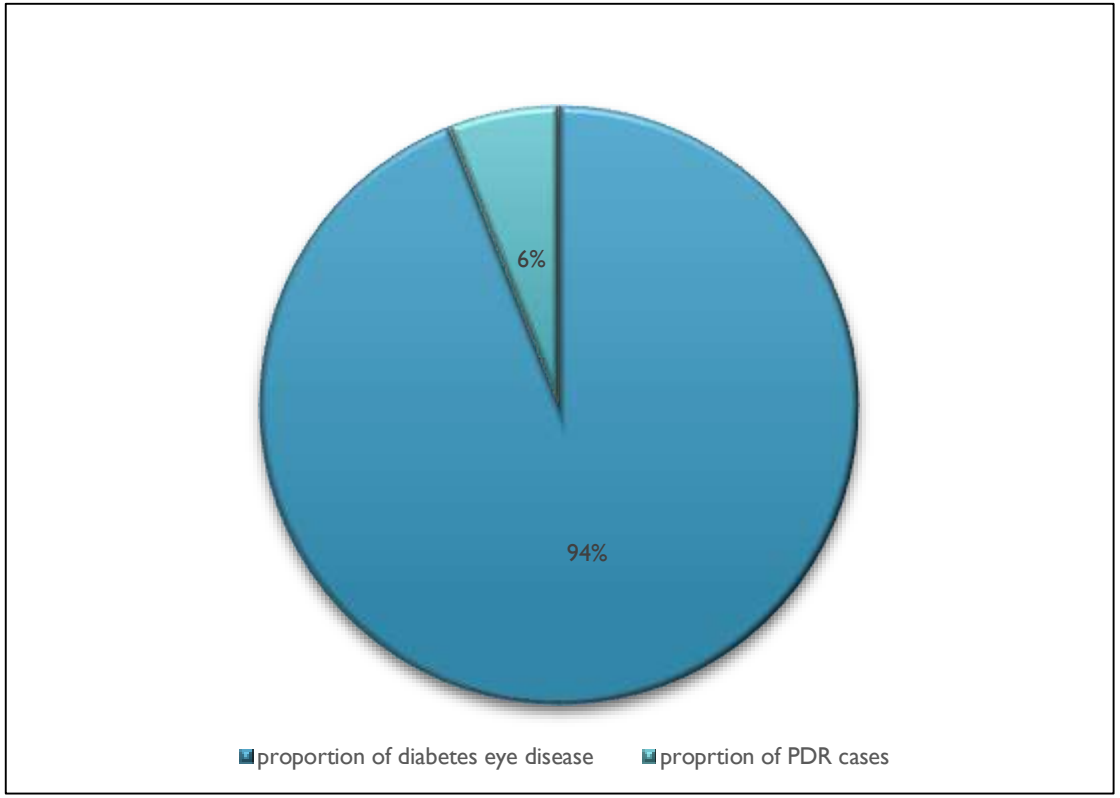

Figure 1. The Proportion of PDR in the diabetes eye diseases population at the PEI diabetic clinic, from 2012-2017.

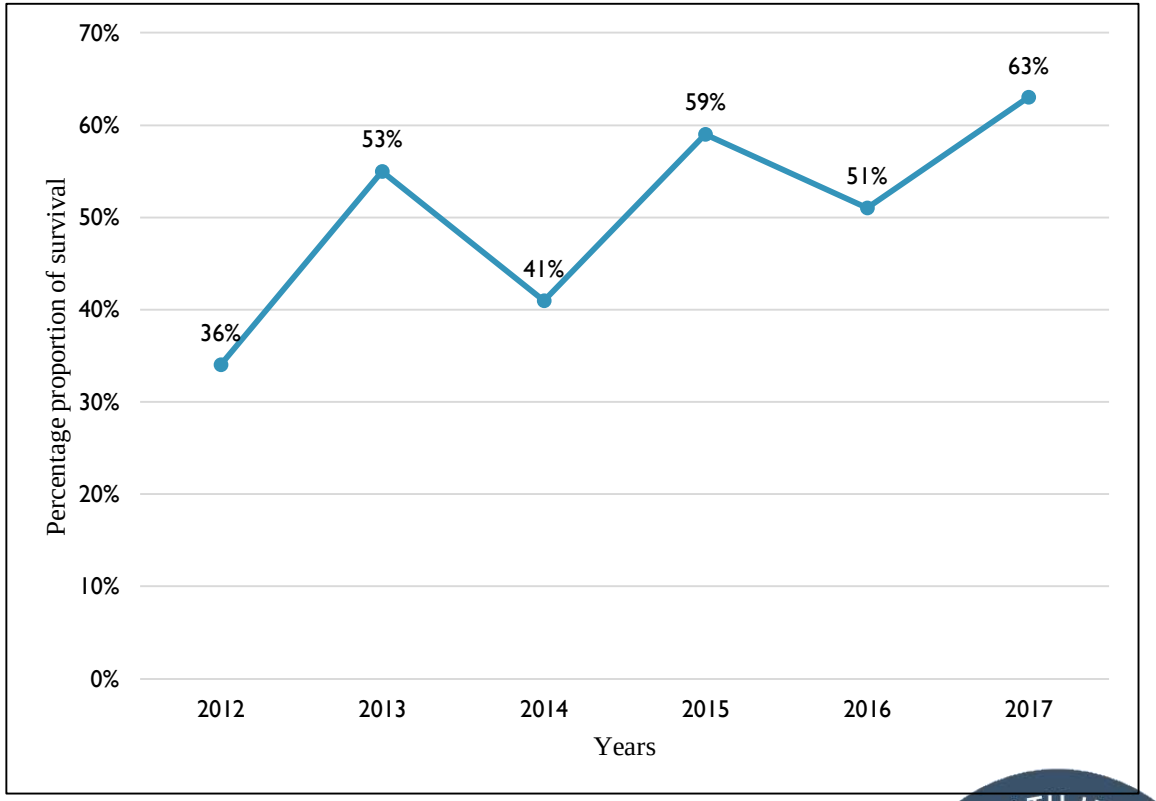

Figure 2. The proportion of survival of PDR cases for each year after underwent laser treatment at PEI, from 2012 to 2017 years.

RESULTS (Cont.)- Survival time and survival probabilities

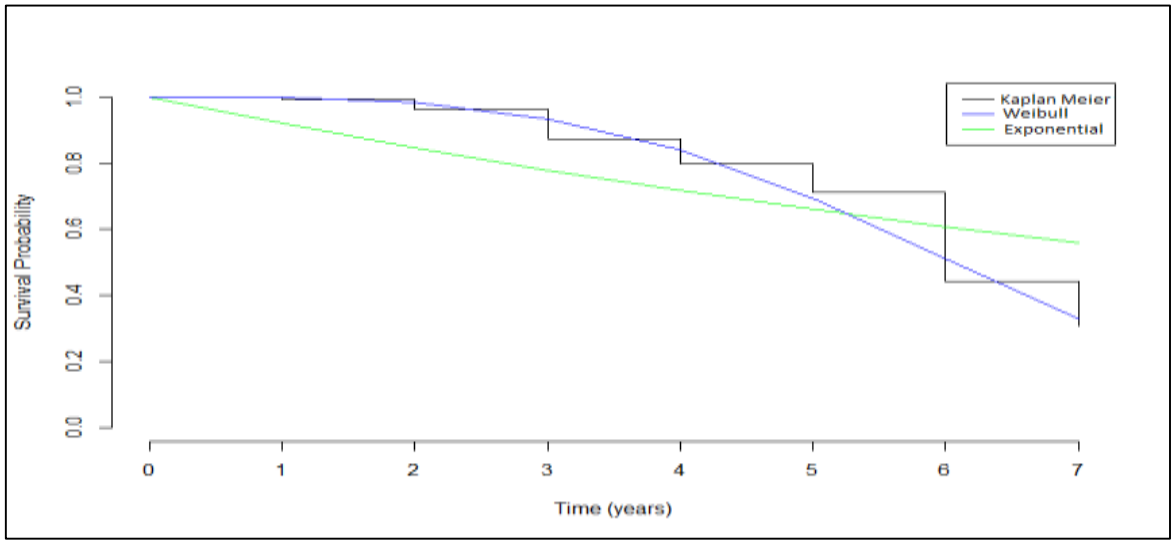

Figure 3. The Kaplan Meier curves illustrates the cumulative survival probabilities against time in years determining the survival time of PDR cases after laser treatment.

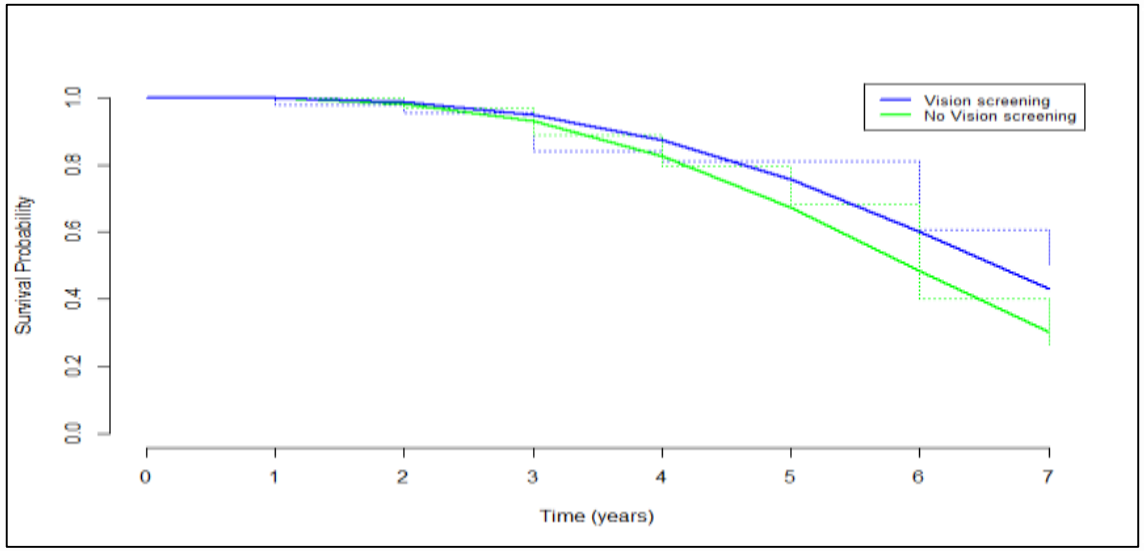

Figure 4. The Kaplan–Meier survival curve comparing the difference in survival time for visually screened with non-visually screened of PDR patients.

The association of factors influenced the survival time of PDR (Cox regression model multivariate)

- PDR patients age older than 56 years was strongly associated with mortality of PDR patients after laser treatment
- PDR patient likely to die at age older than 56 years old after laser treatment than those younger than 56 years old

RESULTS (Cont.) - Current health status

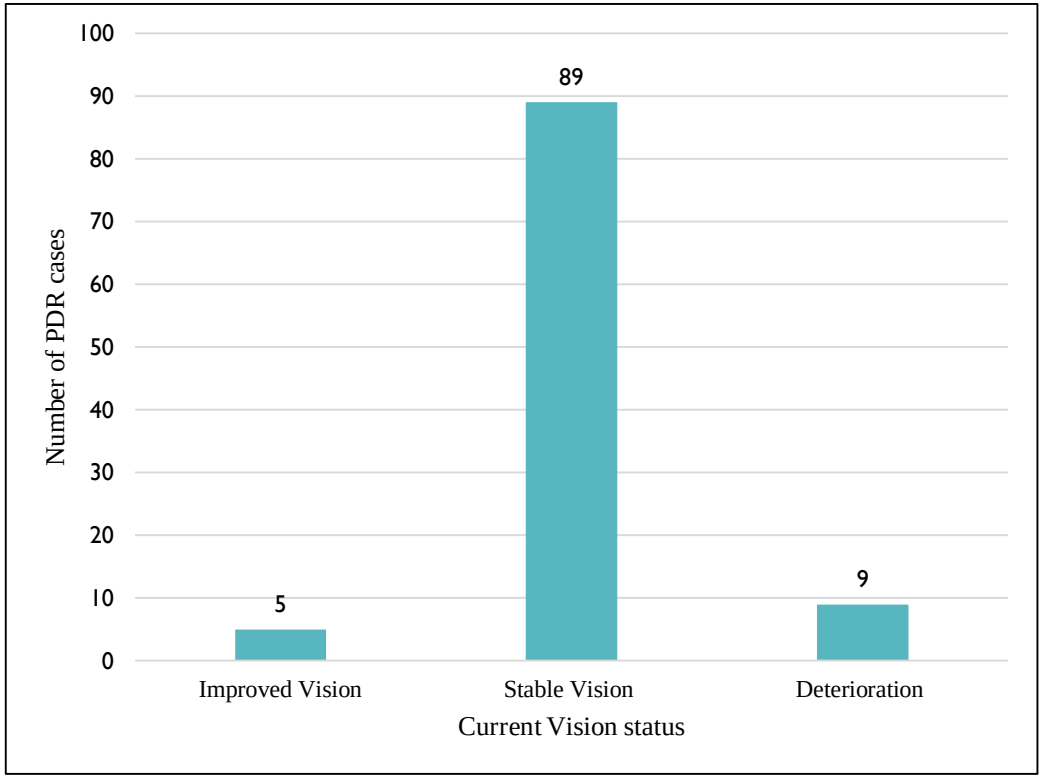

Figure 5. Current vision status of PDR participants after laser treatment at PEI

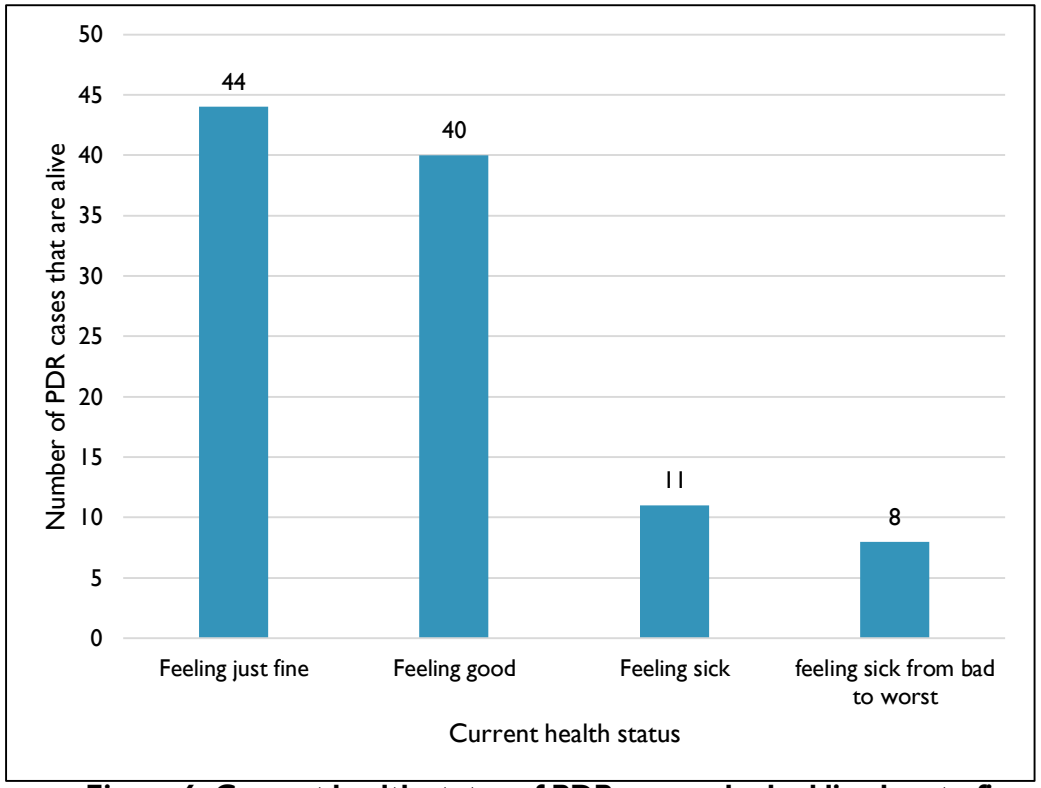

Figure 6. Current health status of PDR cases who had lived up to five years survival time of study.

- Majority of cases are stable, meaning either one or both eyes still blur, watering or painful

KEY FINDINGS

- Only 6% of PDR cases in the diabetic eye disease population between 2012 to 2017
- Median survival time - 6 years- 50 % of PDR cases were alive by 6 years
- The 5-year survival rate was 69% absolute
- Screening status- those Screened have higher survival rate (50.6%).
- There is no difference in median survival time regardless of screening status.
- PDR have high survival rate but laser treatment benefits those who are younger < 56 years than >56 years
- There was no association between screening and survival time and screening does not prolong the median survival time.

DISCUSSION

This study found that :

1. 6 % PDR in this study. Garry et al., (2010) 1.2% PDR cases in Fiji, Bhikoo et al., (2017) found 62% both PDR and macular diseases at PEI in 2017.

2. The median survival time was 6 years. In comparison, Banerjee et al, (2016) found median survival time to be 4.5 years for PDR patients undergoing vitrectomy.

3. The estimated 5-year survival rate 69% absolute. Canlon et al., (2014) supported that, good glycemic control contributes to their rates of survival.
4. The 5 year survival rate for those screened was 50.6 %, those not screened was 25.9%. More research to compare findings.

5. 31% attended retinal screening a year before their treatment. The Pacific DR Program report (2019) found only 13% of diabetes patients received screening in central division of Suva.

6. Age younger than 56 years benefit more from laser treatment than those older than this age. If PEI introduces Vitrectomy surgery, it will benefit ages younger than 56 years. Banerjee, et al., (2016), increasing age is an independent negative indicator for survival.

7. A 9% had deterioration (bad to worse) vision after their laser treatment. Lee at al., (2017) stated laser can worsen night vision and Mohamed (2019) said poor laser outcomes were associated with poor baseline vision

8. Some patients are living in stress and denial. Liu et al., (2012) found health status is dependent on the severity of diabetes ,and Yau et al.,(2012) found diabetes is main factor to health status.

9. It is concluded based on these findings with a 95% confidence that there is no association between screening statues and survival time and screening has no effect on the median survival time.

STRENGTH

- Institution based, focused and more systemic study
- Provides baseline information on survival rate of PDR for PEI and Provides a profile that pacific people can also compare their results with the study findings.
- Informs the Fijian MOH, PEI institution for the importance of resource allocations, policy making, future plans and programs of diabetic retinopathy at the PEI institution.
- Contributes to the current literature on DR and PDR, providing knowledge, information to medical institutions and to health professionals interested in expanding their eye care skills.
- Good database system at the PEI that provides reliable information.

LIMITATIONS

- Data entry issues such as missing data, incomplete data records, multiple data entry.
- Primary data was a challenge . It was the most significant stumbling block in this research.
- Covid 19 restriction made it difficult to communicate with PEI technical supervisor during data collection

CONCLUSION

PDR patients have higher survival rate after laser treatment, with those who have attended retinal screening
Even though the study revealed that PDR is not a major concern, DR and PDR are still adding to the economic costs of laser treatment.

Implications of programs such as :

1. Awareness programs and public health interventions in communities, school and universities should remain a priority to avoid diabetes, DR and its complications

2. Metabolic control of risks factors such as glycemic control in dietary

3. Timely and early referral of DR
4.
5. The ministry of health should revisit its existing strategies and policies to identify areas that needs improvements

6. Health workers should also provide sustainable health information regulary to diabetic patients on possible risk factors of DR

7. Monitoring and evaluating a DR screening program at regular intervals is essential and should occur annually.

8. Understanding the behavioural, cultural, and religious aspects of local populations may assist policy makers better strategize the battle against high consumption of sugar-dense food and beverages

RECOMENDATION

1. Timely treatment must be emphasis during awareness programs for the prevention of diabetic eye disease progression.

2. Review of current base practice guidelines to promote access to retinal screening for high risk populations who may not be accessing mainstream health

3. The MOH, through the public health department should work with the government's price control unit to consider raising the price of some processed goods that are higher in sugar, to help reduce the consumption of high-sugar foods, which will be a chance of lowering the risk of diabetes

4. The MOH through public health department and other stake holders should consider internet based content and information technology to be a vehicle for enhancing education support in diabetes as a strategy to avoid retinopathy

5. The importance of vision screening must be emphasize

6. Tracing of non-attenders with evidence of retinopathy should be effectively carried out.

7. It is recommended that age categories must also be considered as one of the criteria checklist for vitreous surgery

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