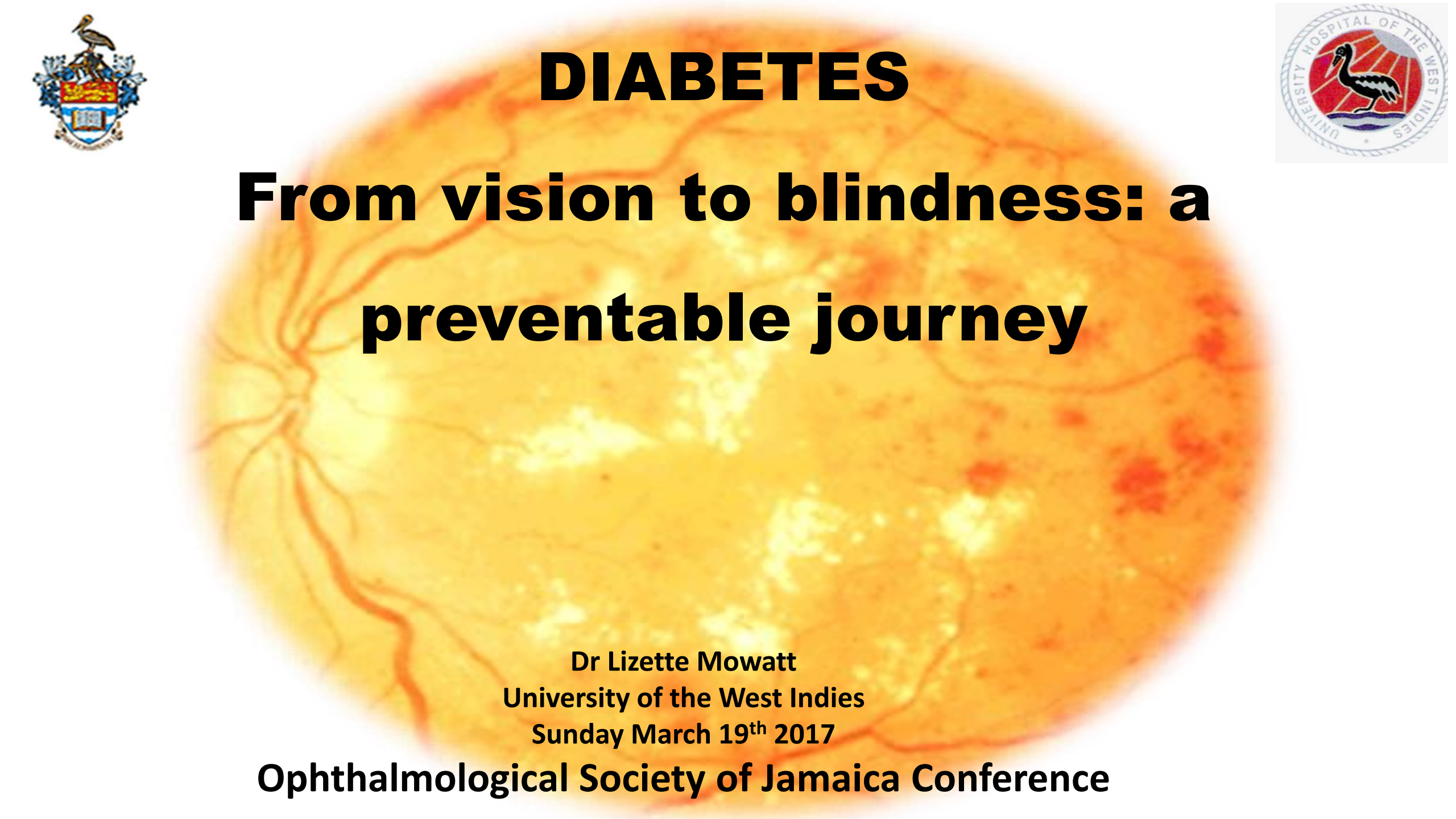


DIABETES

From vision to blindness: a preventable journey

Dr Lizette Mowatt
University of the West Indies

Sunday March 19th 2017

Ophthalmological Society of Jamaica Conference

THE FACTS
International Diabetes Federation 7th edition 2015

- 415 million people had diabetes in 2015
- ~640 million in 2040
- 80% of DM (low/middle-income countries)
- Most diabetic patients are 40 to 59 years of age
- Jamaica has a 11.5% prevalence
- ~300,000 people have DM
- 50% don't know they have diabetes

International Diabetes Federation

Complications of Diabetes

Microvascular

Retinopathy

Neuropathy

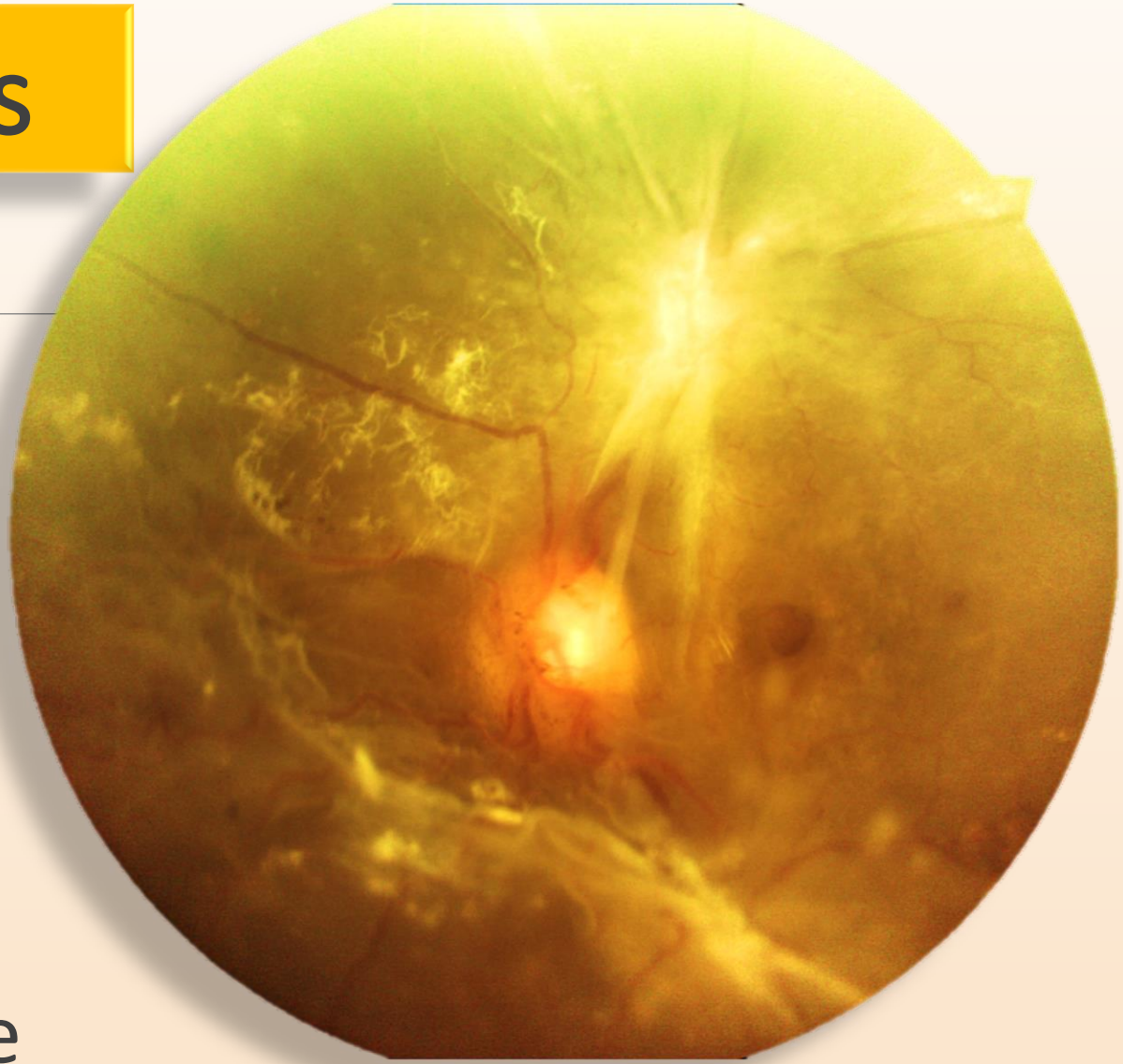
Nephropathy

Macrovascular

Cerebrovascular disease

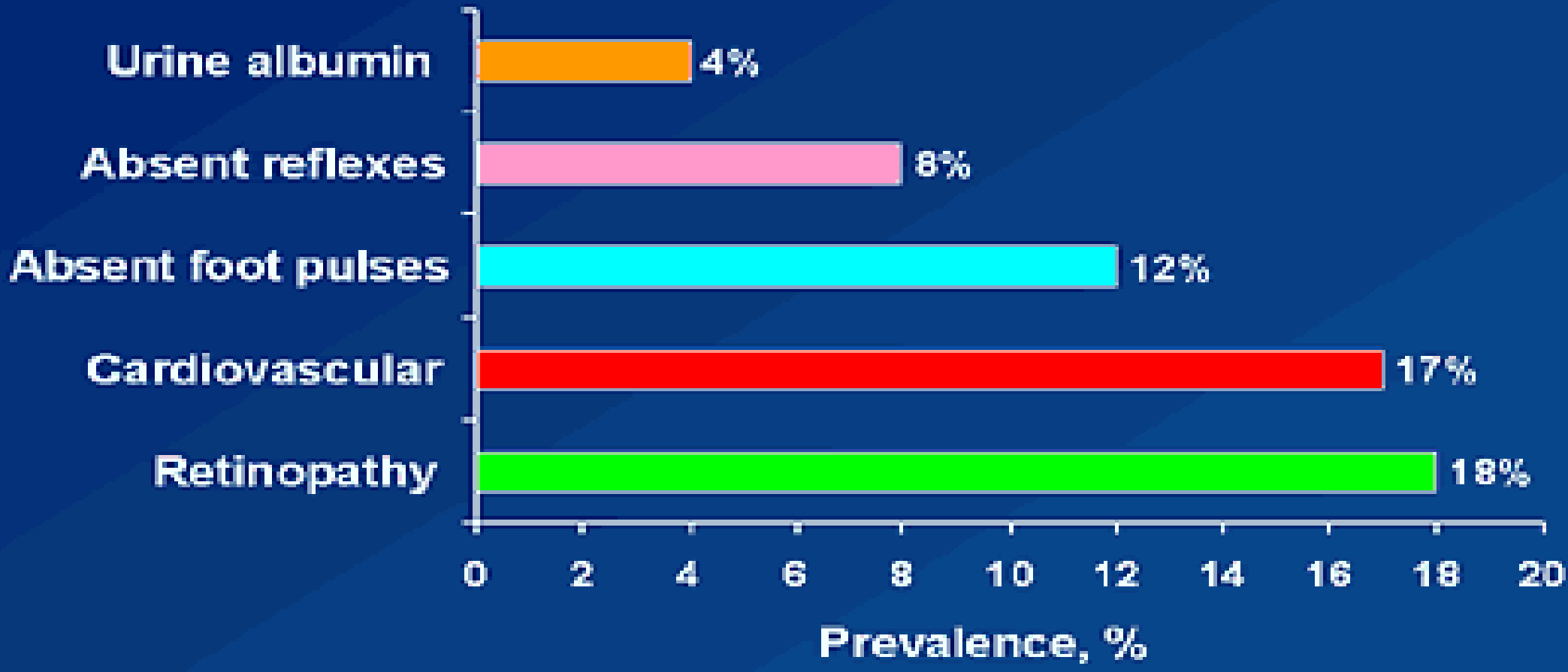
Perpheral Vascular Disease

Coronary Heart Disease



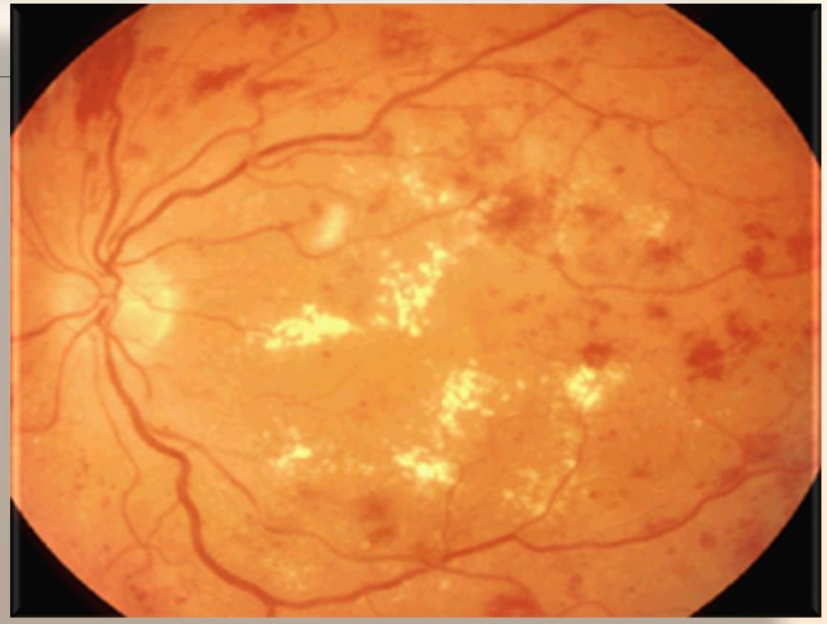
Diabetic Retinopathy

Prevalence of Diabetic Tissue Damage at the Time of Diagnosis of Type 2 Diabetes



Dagogo-Jack S et al. *Arch Intern Med*. 1997;157:1802–1817.

United Kingdom Prospective Diabetes Study



UK PDS Study

Large scale trial over 10 year period

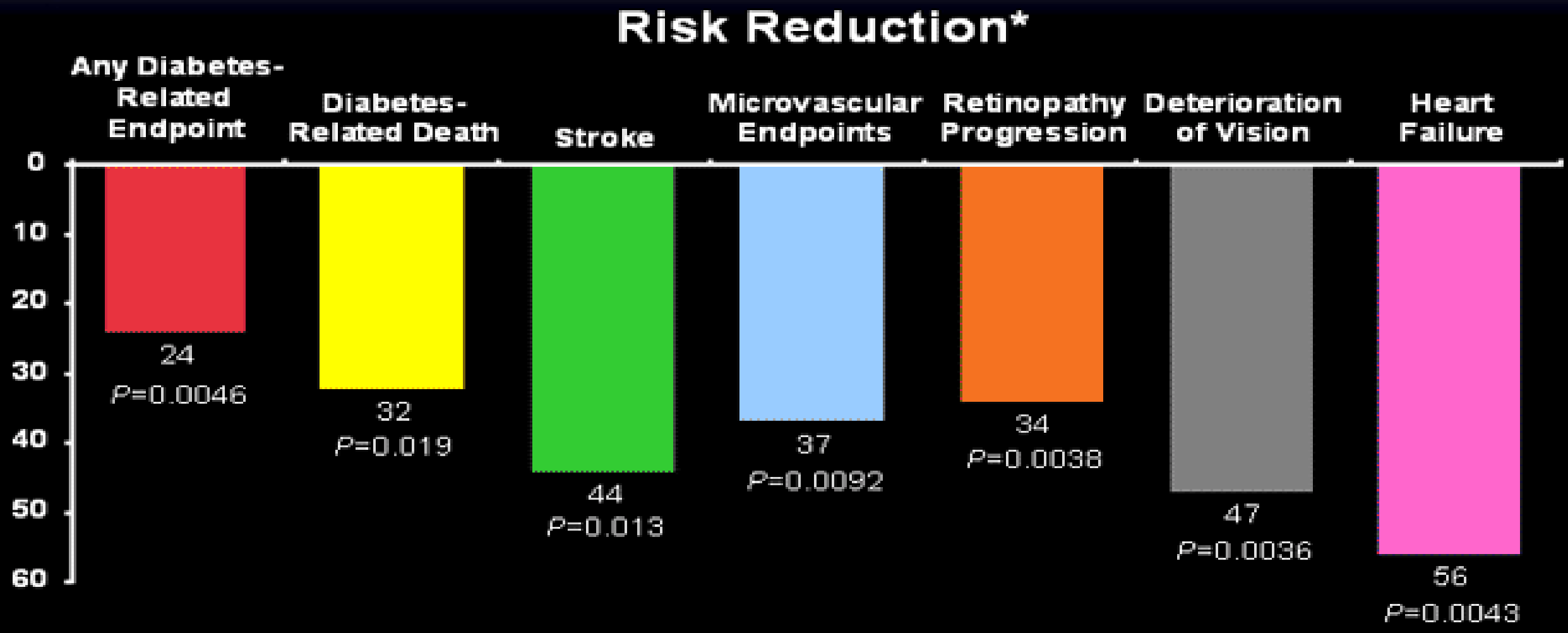
5102 newly diagnosed Type II

Diabetic retinopathy in the newly diagnosed NIDDM

- **39% of Males**
- **35% of females**

UKPDS gp BMJ 1998;317:703-713

UKPDS Results: Tight Blood Pressure Control

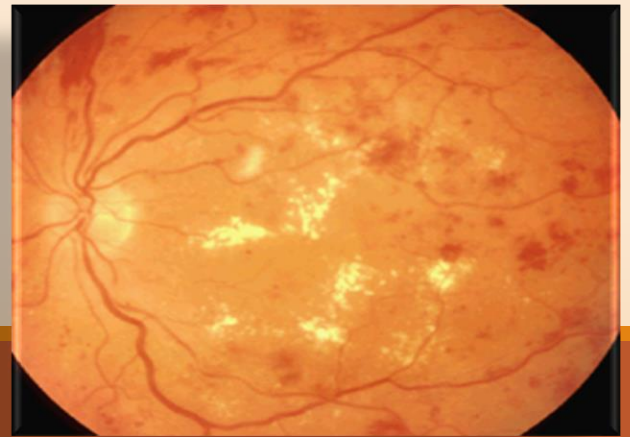


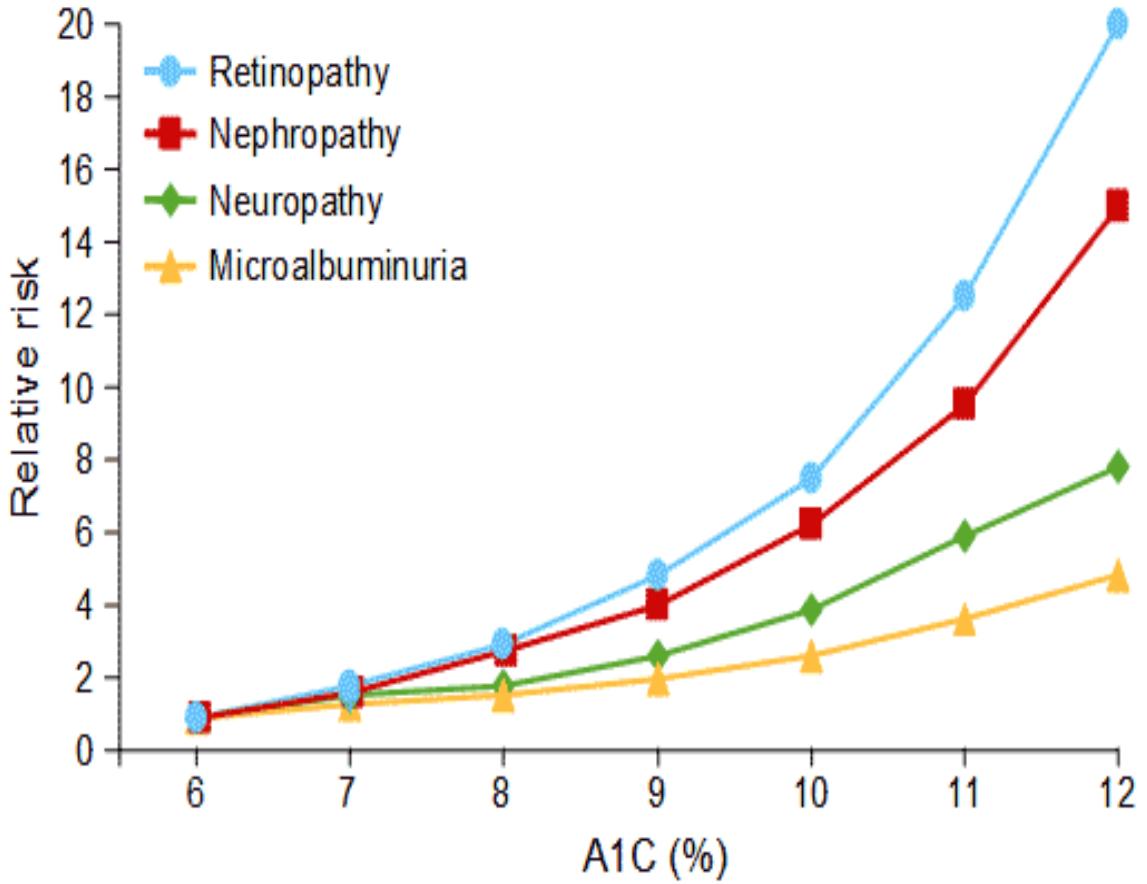
Diabetes Control & Complications Trial (DCCT)

HbA1C levels & risk of complications in type 1 diabetes

Good glycemic control with intensive therapy reduces the incidence of

- Retinopathy by 63%
- Nephropathy by 39%
- Neuropathy by 60%





Patients with type 1 diabetes (n=1,441)

What do we know about Jamaican Diabetics

Duff et al , ***West Indian Med J 2006; 55 (4): 232***

Study done on Diabetics in Medical Clinic UHWI

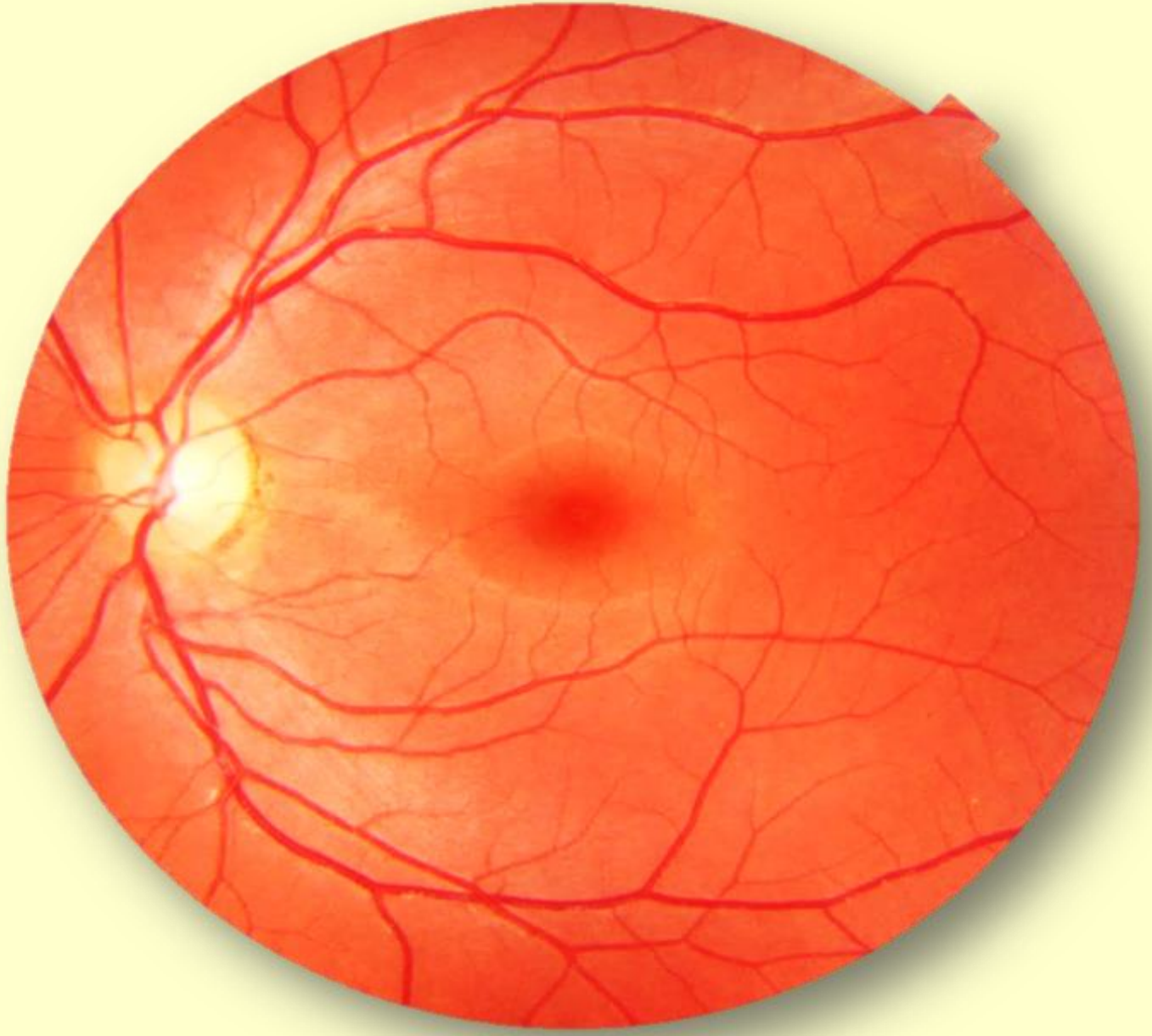
- **F:M ratio 2.8:1 (n=133)**
- **81% had a BMI of >25kg/m²**
- **27% had BP ≤130/80**
- **23% HbAlc <6.5%**
- **Only 7% used a glucometer regularly**

Diabetic Retinopathy is PREVENTABLE

Greatest risk factors:

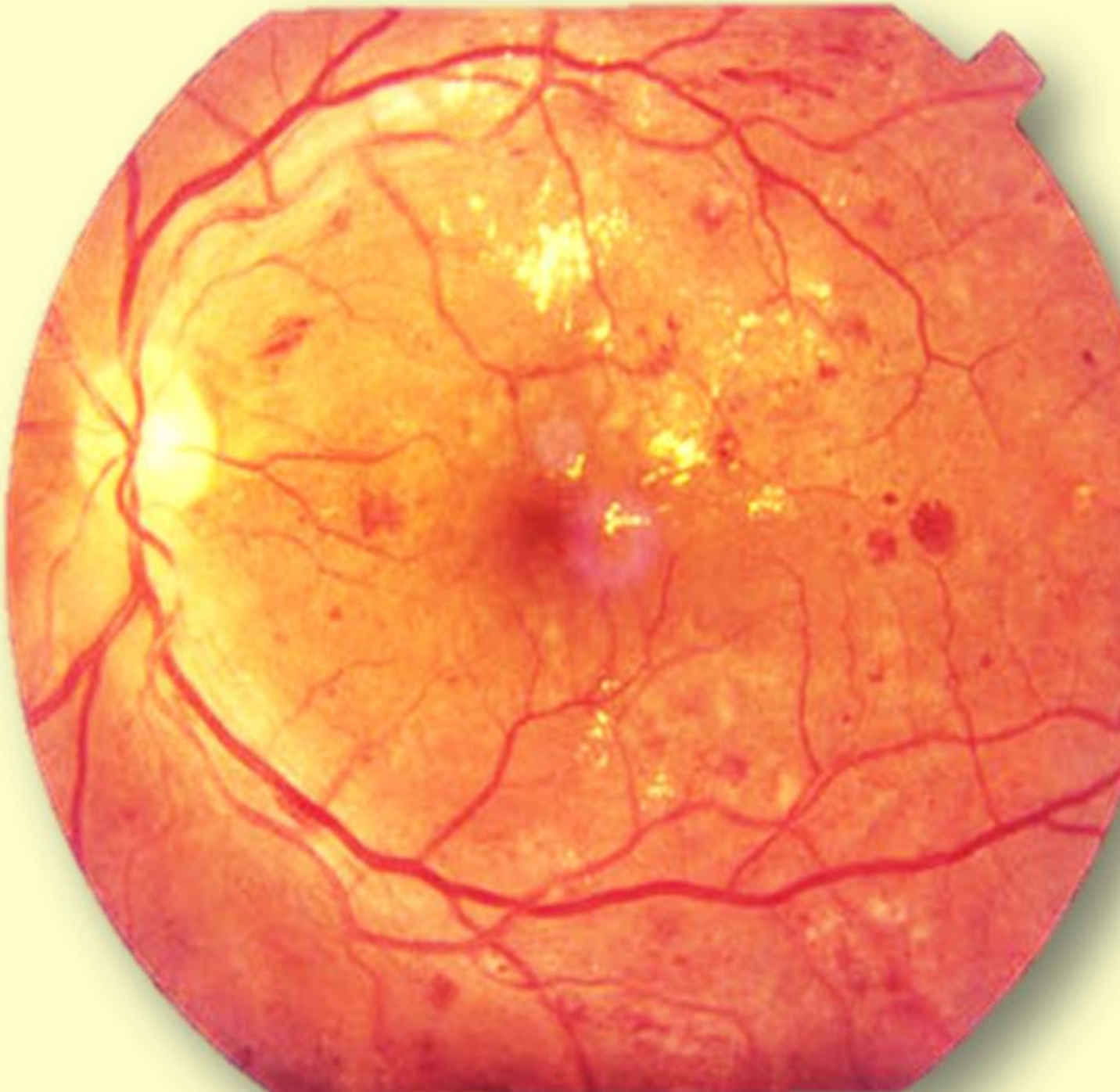
- Uncontrolled diabetes
- Uncontrolled hypertension

Normal



BACKGROUND DIABETIC RETINOPATHY

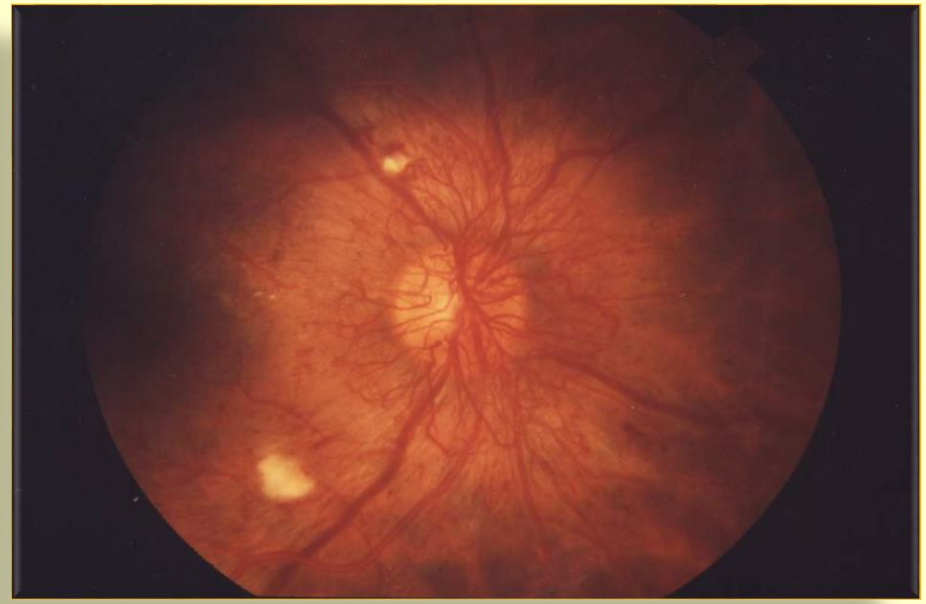
- Microaneurysms
- Dot & Blot haemorrhages
- Hard exudates
- Retinal Thickening

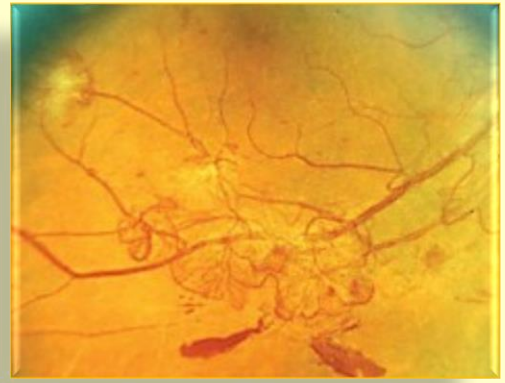


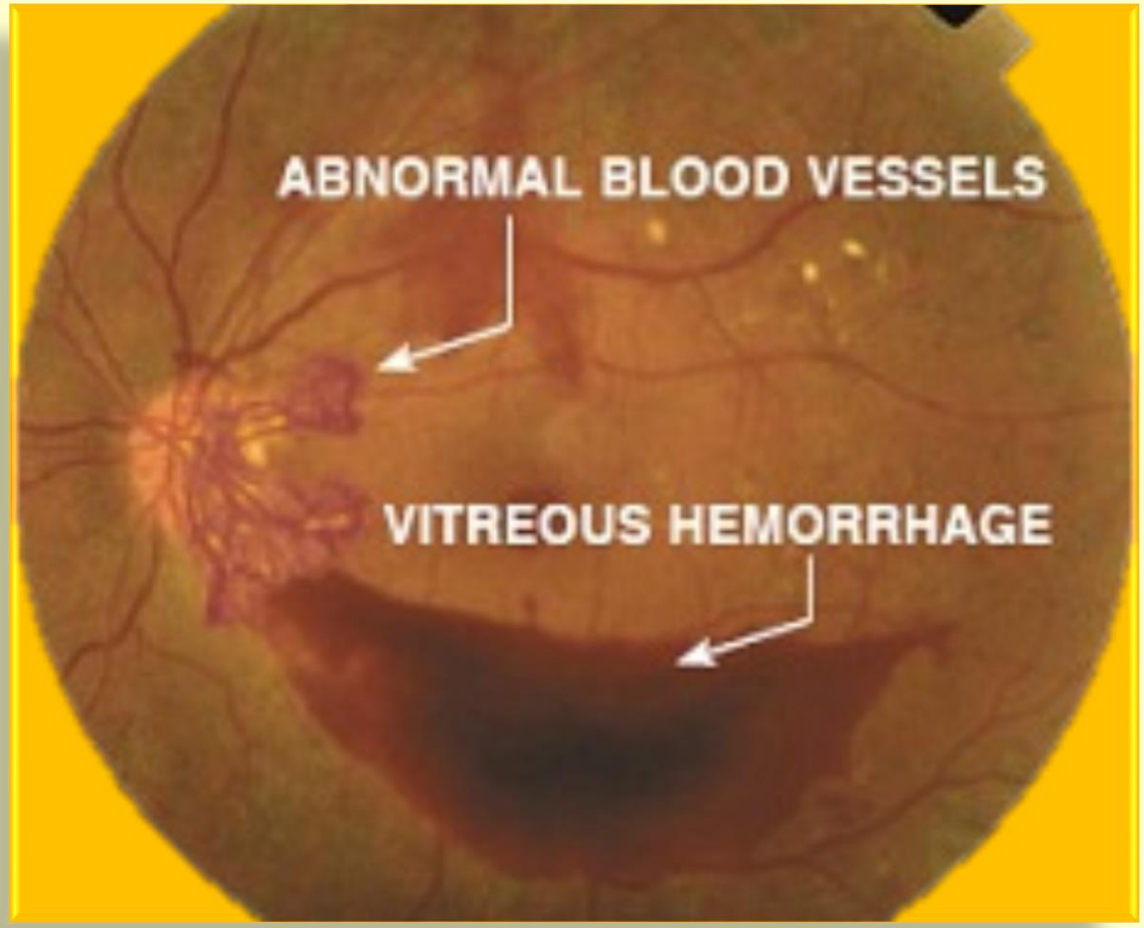
PREPROLIFERATIVE DIABETIC RETINOPATHY

- Cotton wool spots
- Deep darker haemorrhages
- IRMA
- Venous beading
  - omega loops

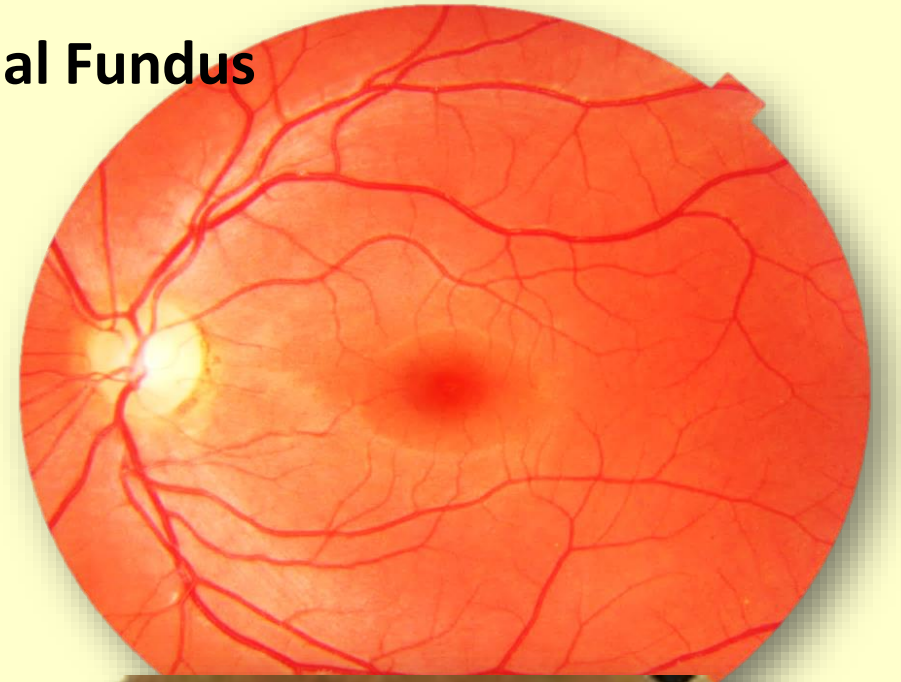
PROLIFERATIVE DIABETIC RETINOPATHY



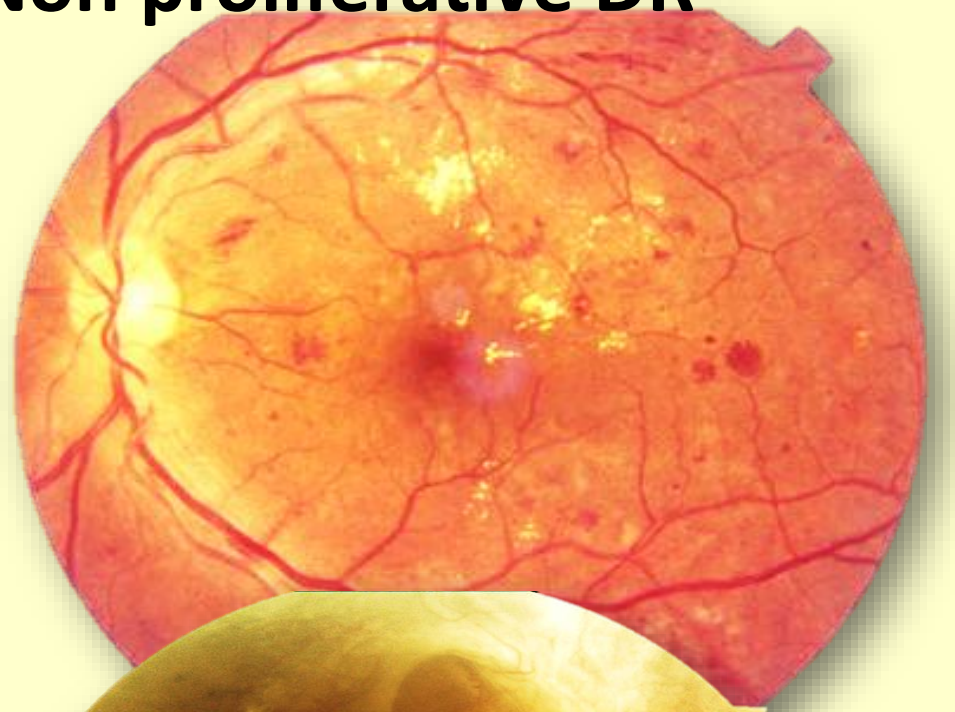


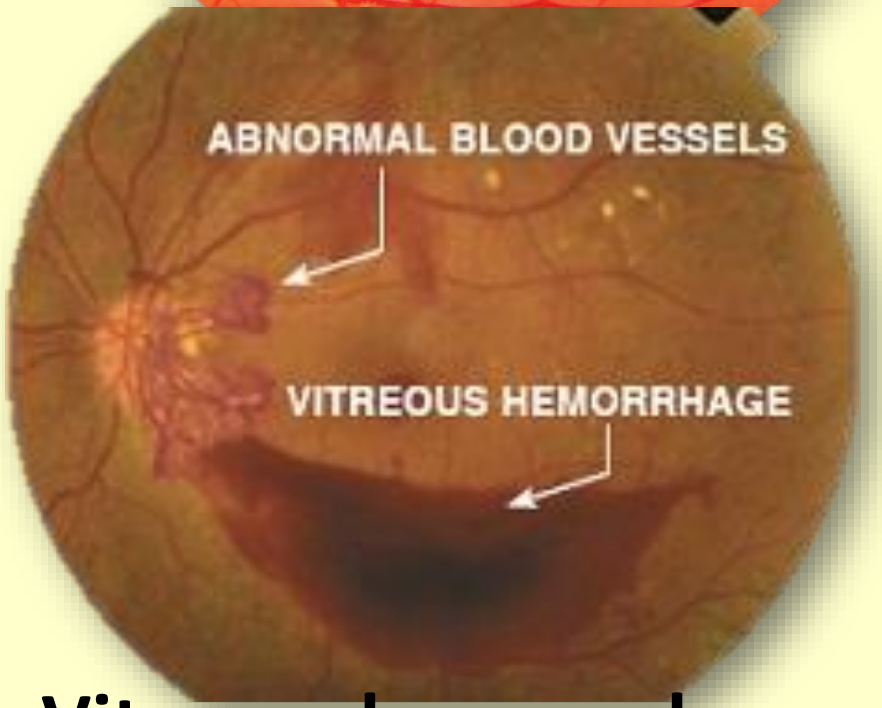


Normal Fundus

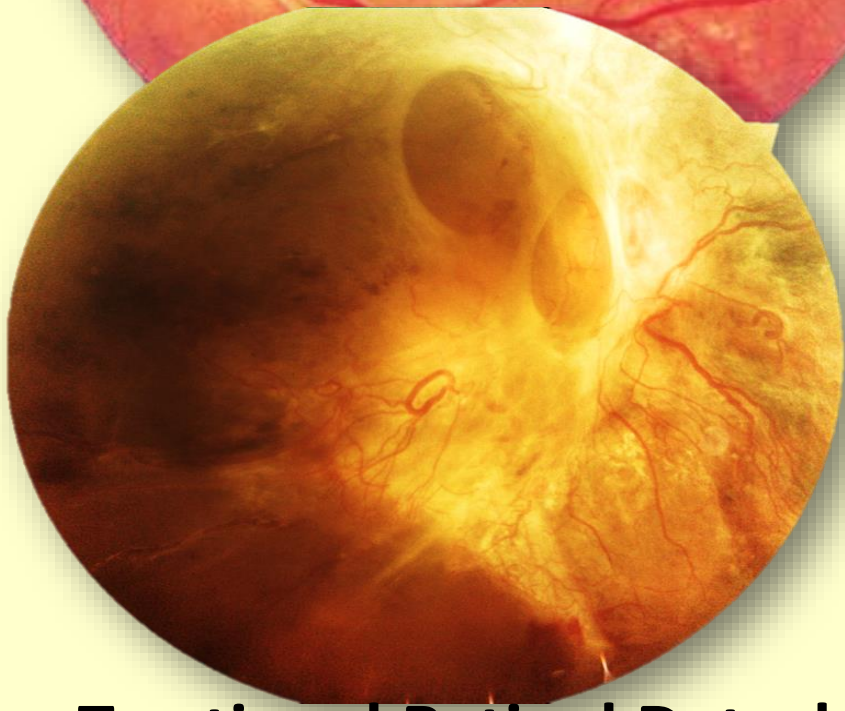


Non proliferative DR





Vitreous haemorrhage

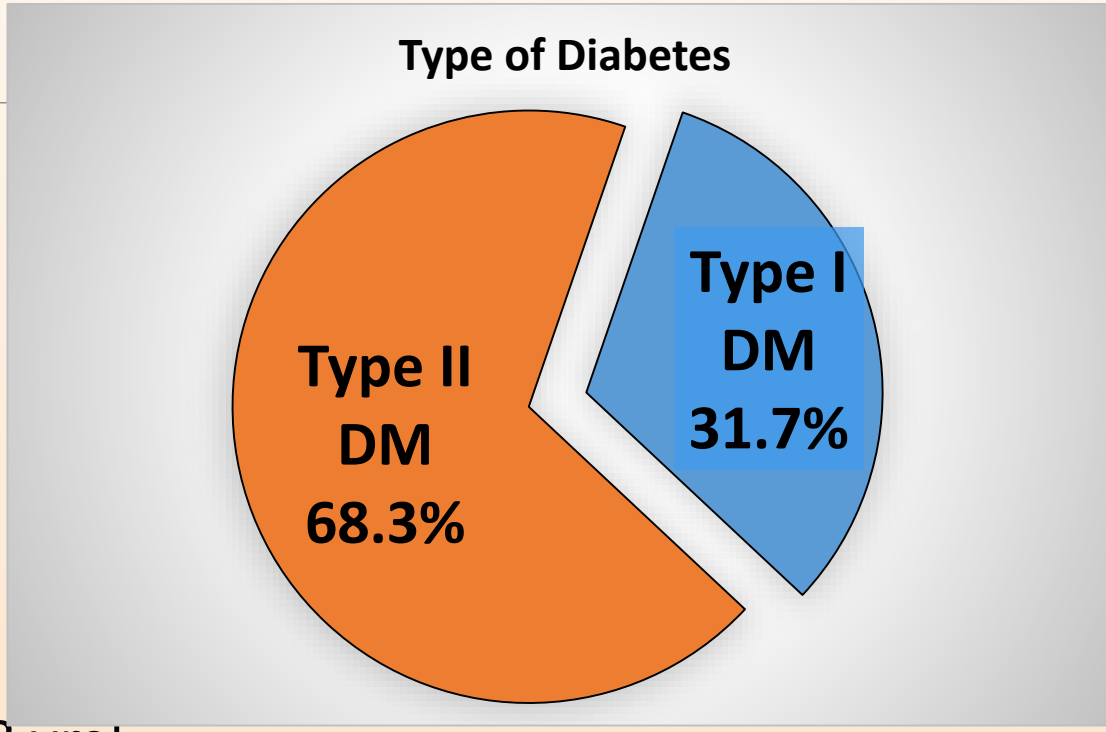


Tractional Retinal Detachment

Diabetic Retinopathy status at UHWI

Mowatt L. Middle East Afr J Ophthalmol. 2013 Oct-Dec;20(4):321

Prospective cohort study at UHWI Eye Clinic



Results

104 patients (208 eyes) recruited

58.6% Females (mean age 53.6 yrs)

41.4% Males (mean age 61.7 yrs)

Diabetes duration: 4/12 -45 years [mean 17.8 yrs]

Blood glucose range 3.4 – 27.6 mmol/l [mean 11.4 mmol/l]

No correlation between duration of diabetes and good sugar control (Pearson's correlation coefficient=0.056; p=0.29)

Mean Blood glucose levels According to Type I and II DM

GENDER	TYPE I IDDM Blood Glucose (mmol/L)	TYPE II NIDDM Blood Glucose (mmol/L)
Total Group Mean ± SD	12.7 ± 5.9	10.7 ± 4.9
Male Mean (Range)	13.5 (5.4 - 23.5)	10.2 (3.4 – 19.1)
Female Mean (Range)	12.6 (4.9 - 27.6)	11.1 (4.3 -23.6)

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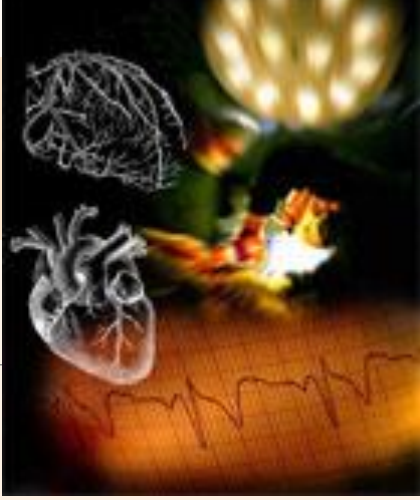
HYPERTENSION



82.7% of Total group were hypertensive

Type 1 DM: 66.7%

Type II DM: 88.7%

	Systolic	Diastolic
Maximum	**230mmHg**	**160mmHg**
Minimum	**100mmHg**	**66mmHg**

Jamaican Hypertension prevalence study:

Diabetics had X2 risk of developing hypertension vs non diabetics

Blood Pressures according to Gender and type of DM

BP (mmHg)	TYPE I DM		TYPE II DM	
	MALES	FEMALES	MALES	FEMALES
Mean Systolic Range	154 (146-185)	164 (107-214)	151 (124-219)	154 (100-230)
% > 130mmHg	100%	75%	87%	87%
Mean Diastolic Range	93 (88-112)	85 (66-103)	90 (72-160)	90 (73-140)
%>80 mmHg	100%	75%	67%	80%

Blood Pressures according to Gender and type of DM

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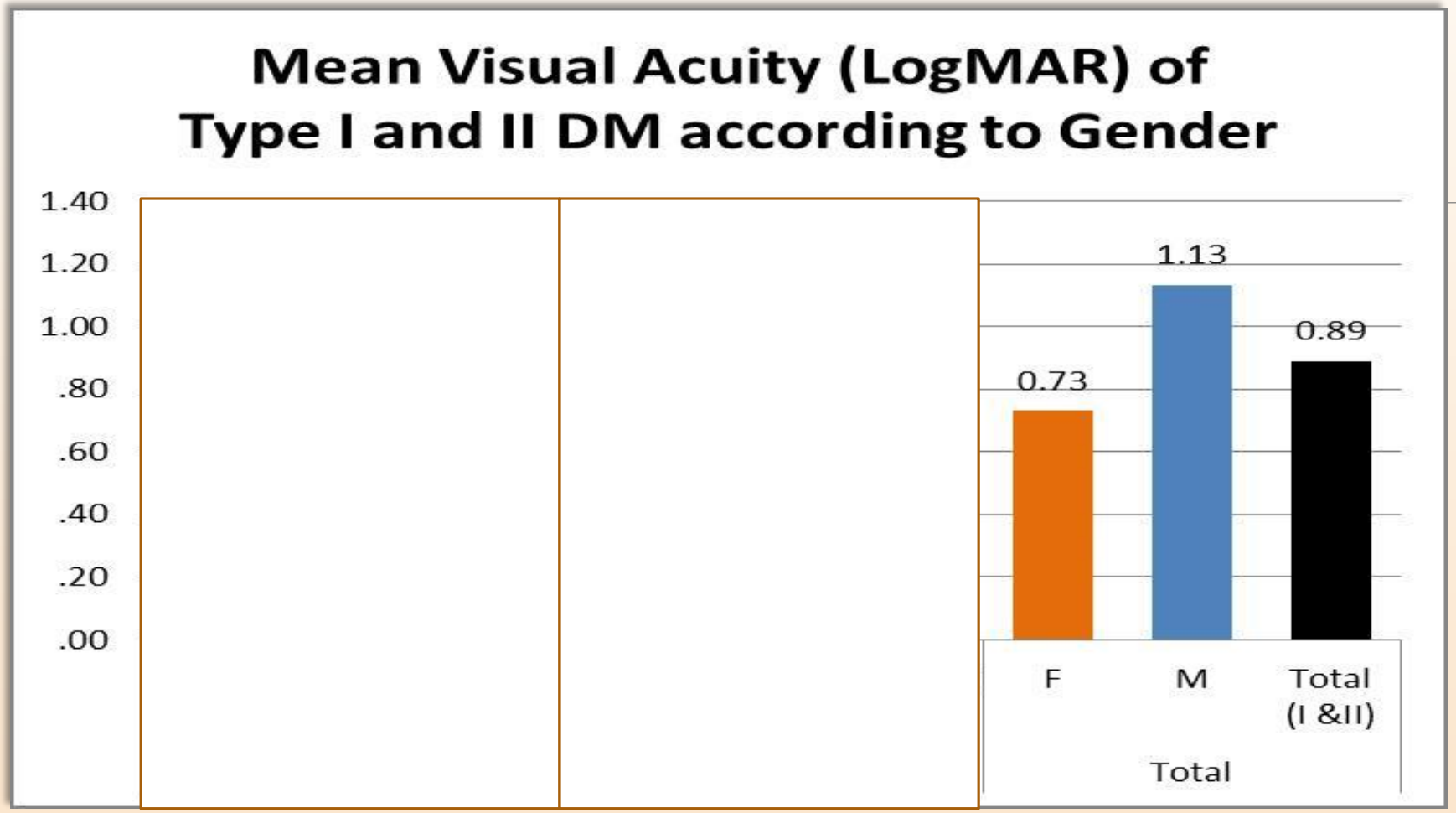
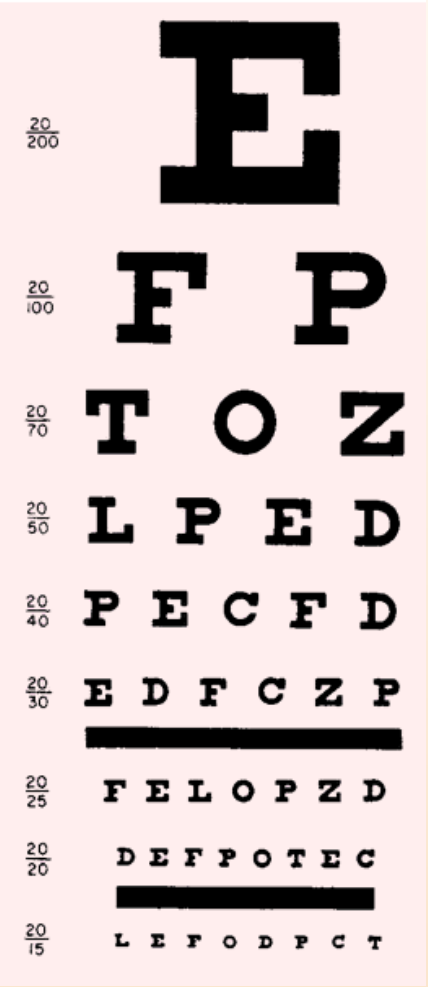
Visual Acuity According to Type of Diabetes & Gender



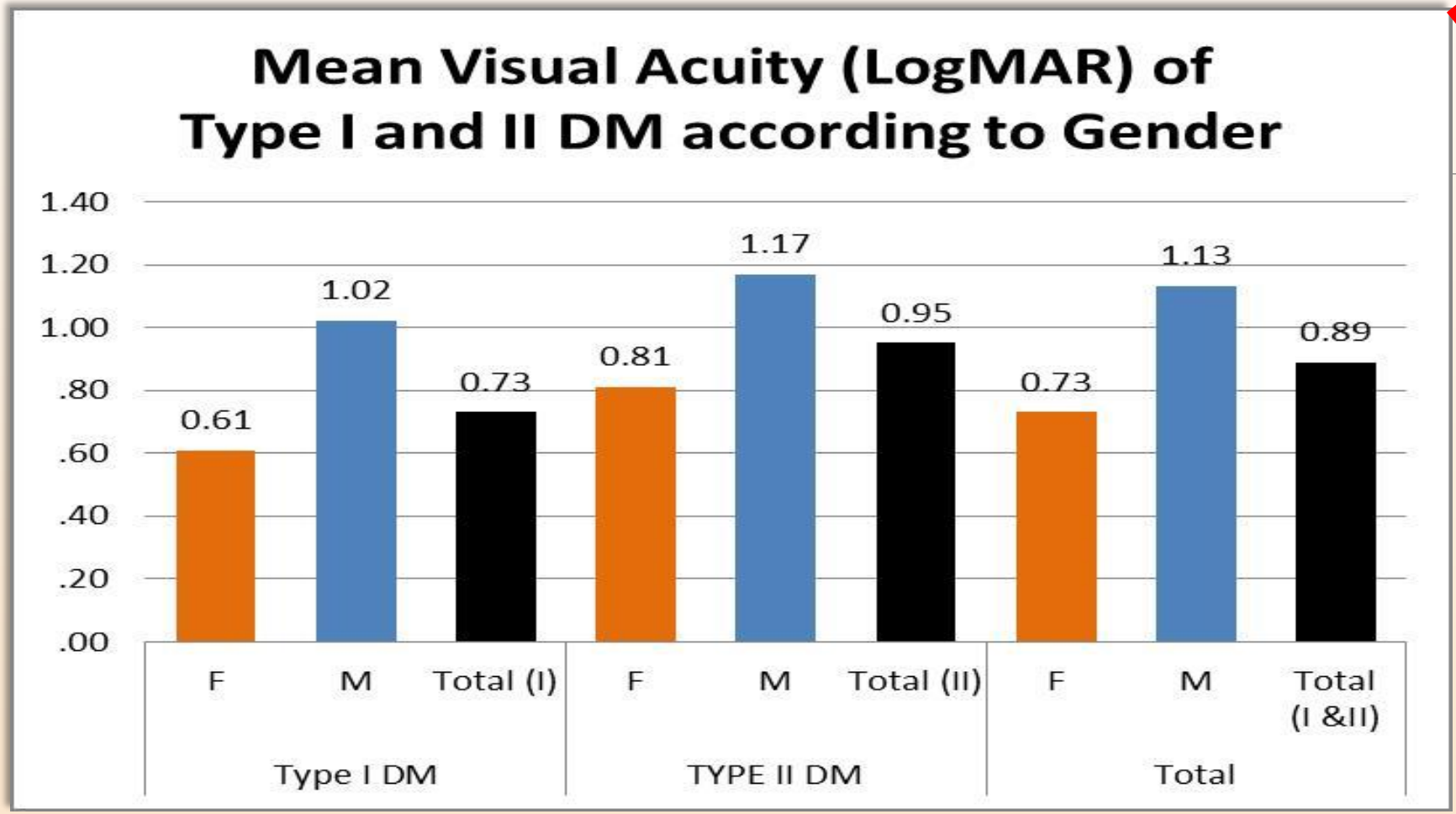


Mean of 0.89 logMAR for the total group

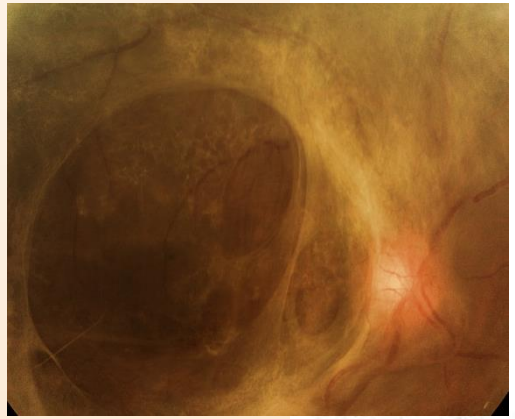
Males had the worse vision in Type I and II DM

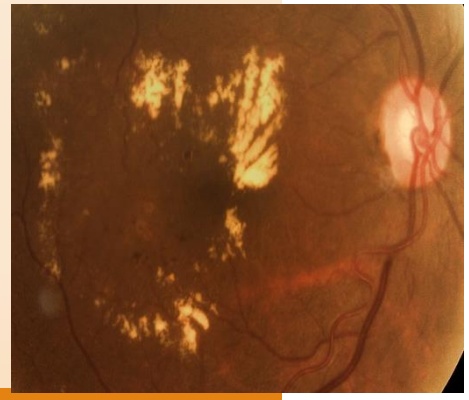
IDDM group had better vision than NIDDM (p=0.02)

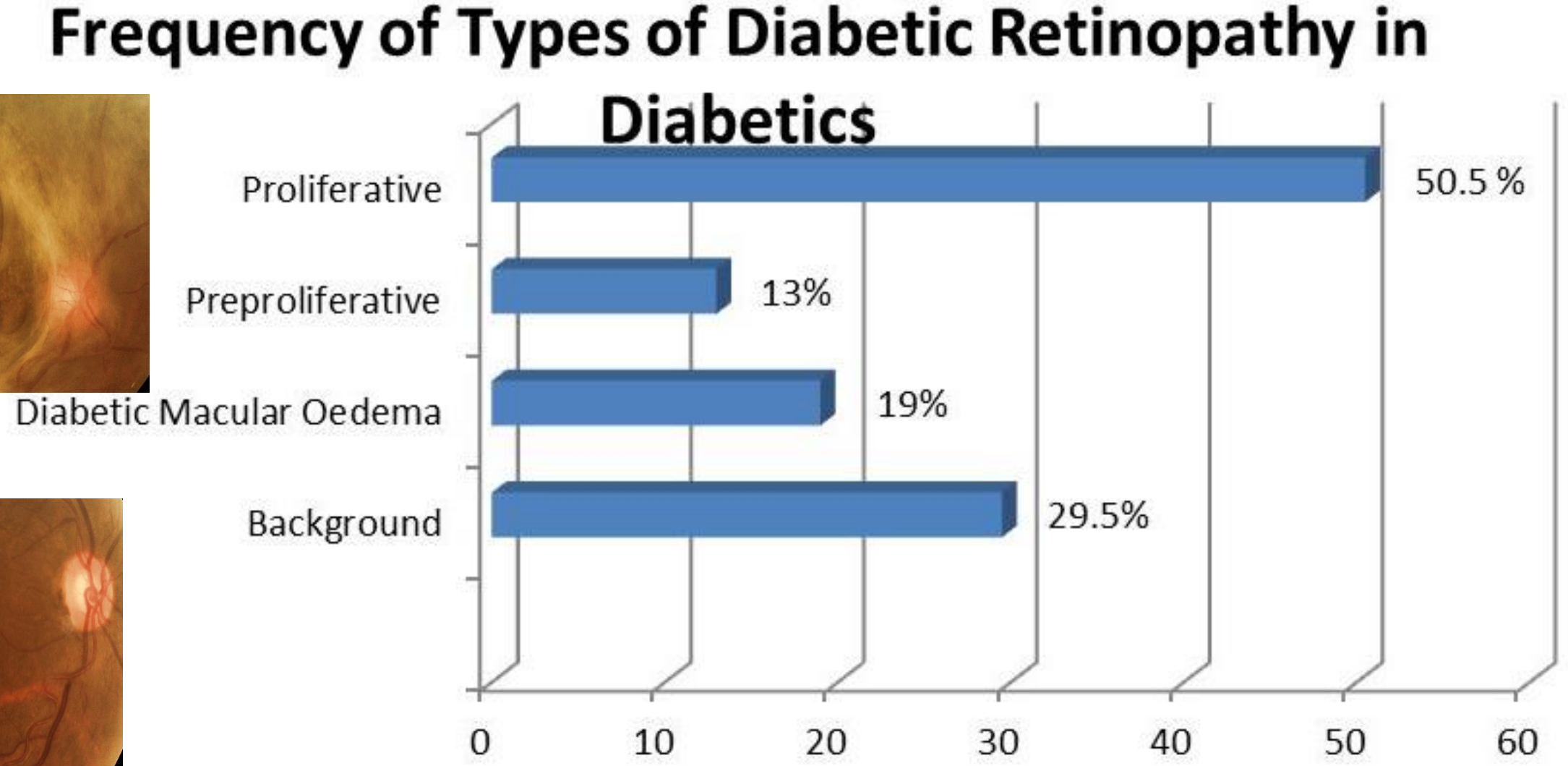
Visual Acuity According to Type of Diabetes & Gender



Diabetic Retinopathy was present in 78%

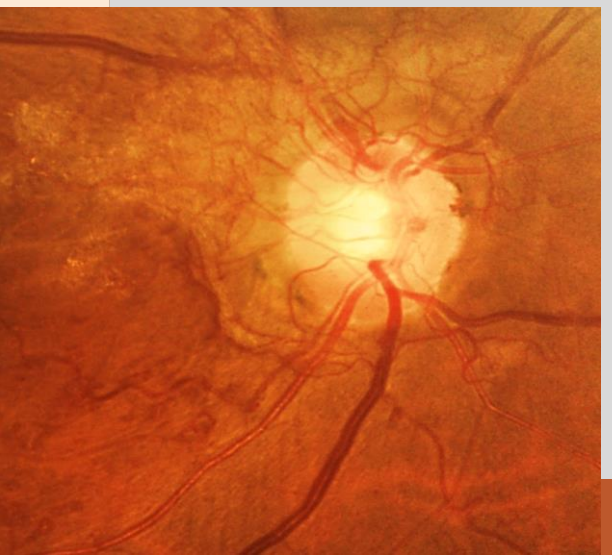


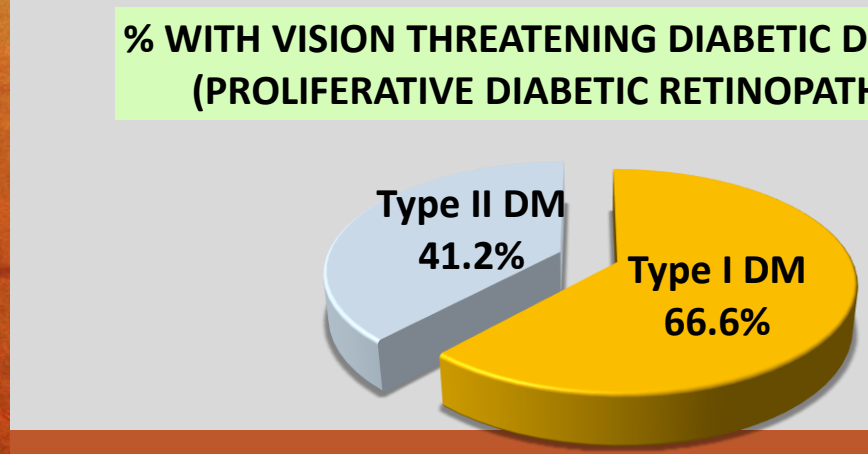


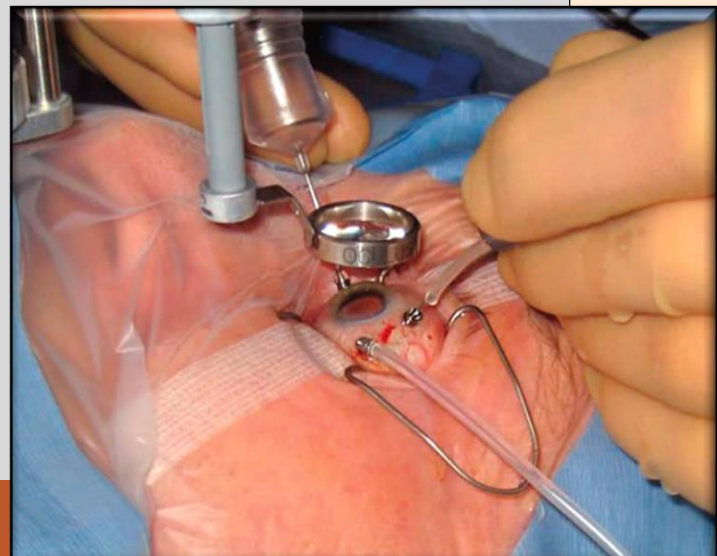


Odds Ratio of Developing Visual Threatening Diabetic Retinopathy (Proliferative Diabetic Retinopathy)

GROUP	Odds Ratio for Developing Proliferative Diabetic Retinopathy (PDR)	(95% Confidence Interval)
Type 1 DM	1.88	(1.02 -3.[illegible]) p=0.028
Type II DM	0.74	(0.55-0.99)







Knowledge, Beliefs and Practices of Patients with Diabetic Retinopathy at the UHWI

Foster T, Mowatt L, Mullings J. J Community Health. 2016 Jun;41(3):584-92

- Prospective cross sectional study.
- Single interviewer administered questionnaire on their knowledge, beliefs and practices (KBP) of eye exams, lifestyle practices; special diet, exercise and medication compliance

RESULTS: 150 patients: 66% were female.

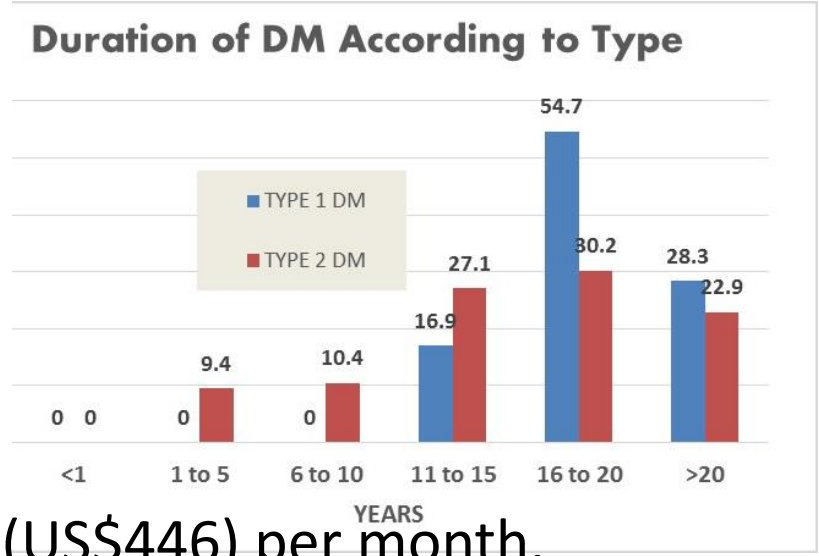
Mean ages were 57 years (females) and 47.3 years (males)

61.4% were overweight (BMI >25kg/m^2)

Tertiary education was achieved in 18.9%

73% were unemployed

Of the employed patients, 62.5 % earned an income ≤J$50,000 (US$446) per month.



Knowledge, Beliefs and Practices of Patients with Diabetic Retinopathy at the UHWI

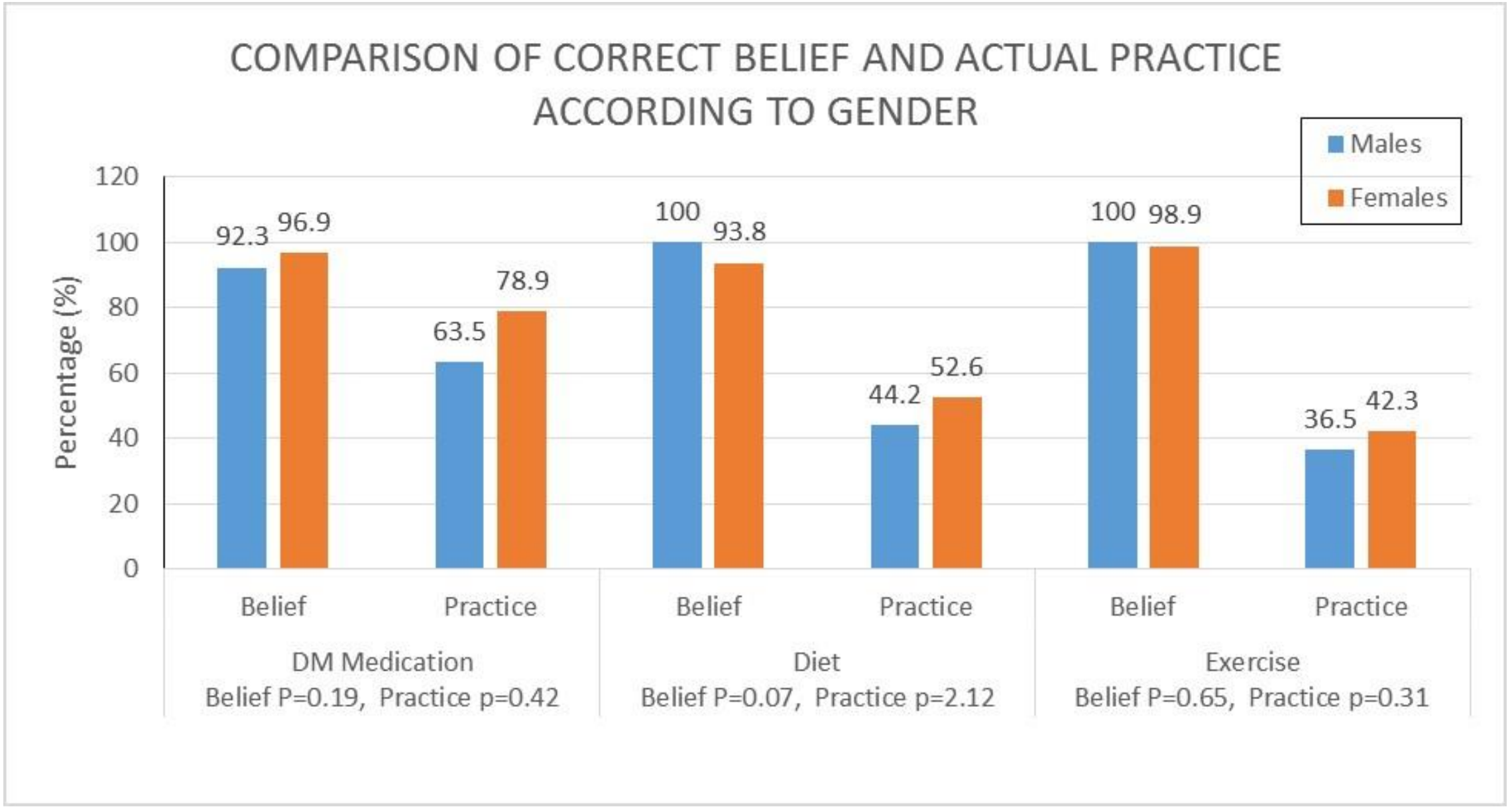
- Foster T, Mowatt L, Mullings J. J Community Health. 2016 Jun;41(3):584-92

Mean knowledge scores

- Males: 86%
- Females: 82.8% (p=0.260)

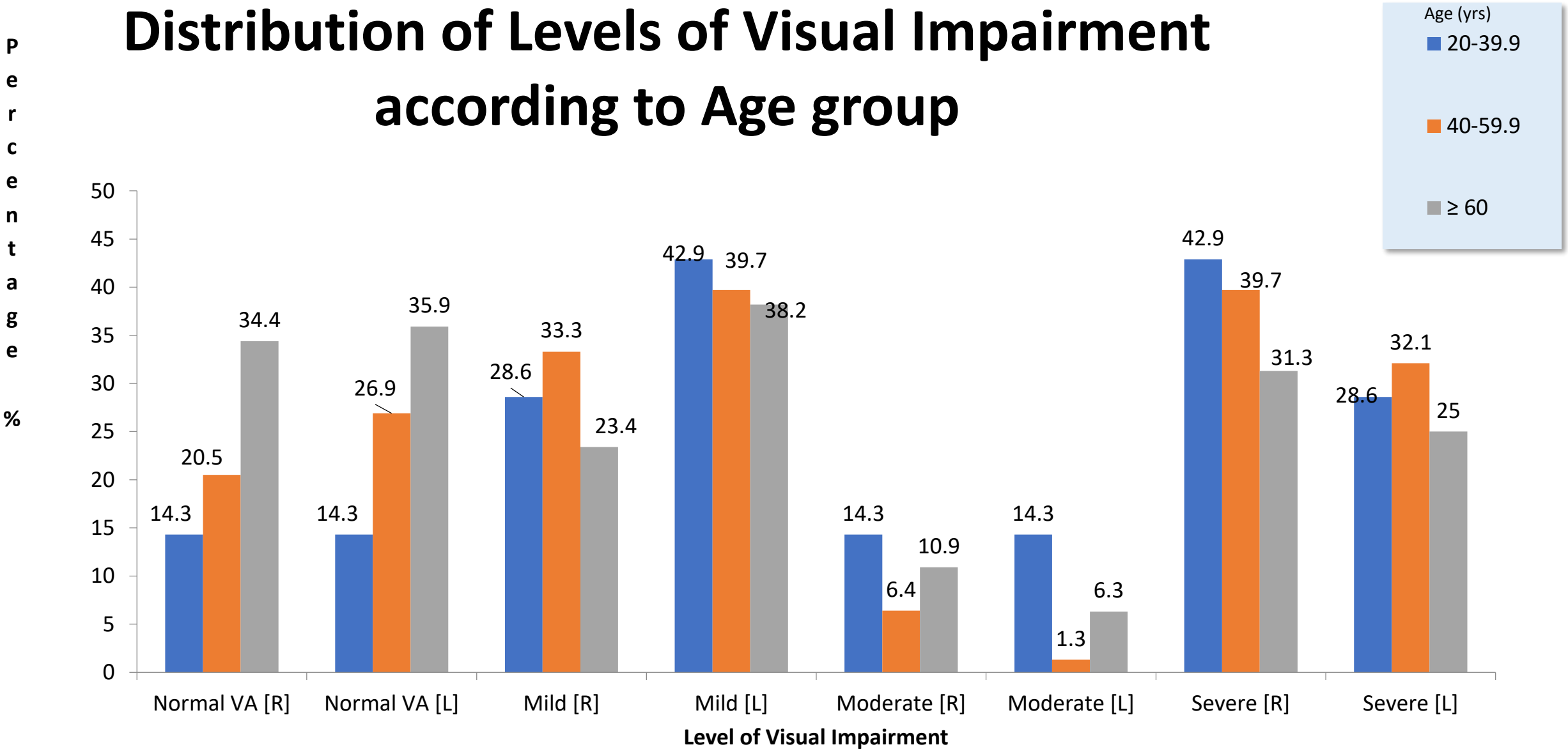
Relationships:

- Knowledge & duration of DM (p = 0.111)
- Good glucose control and knowledge (p = 0.028).

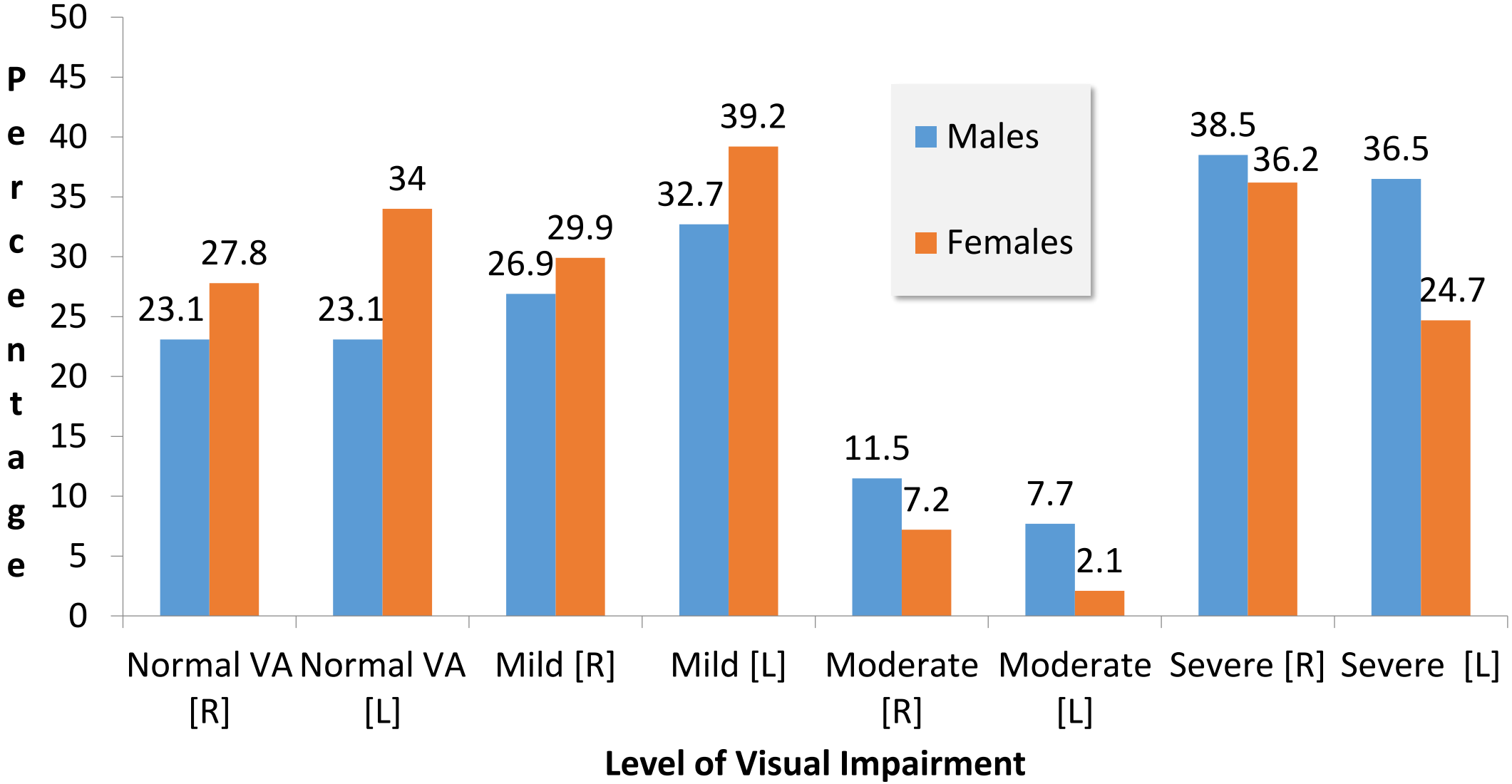


knowledge and beliefs did not correspond to a high level of compliant practices

Distribution of Levels of Visual Impairment according to Age group



Level of Visual Impairment according to Gender

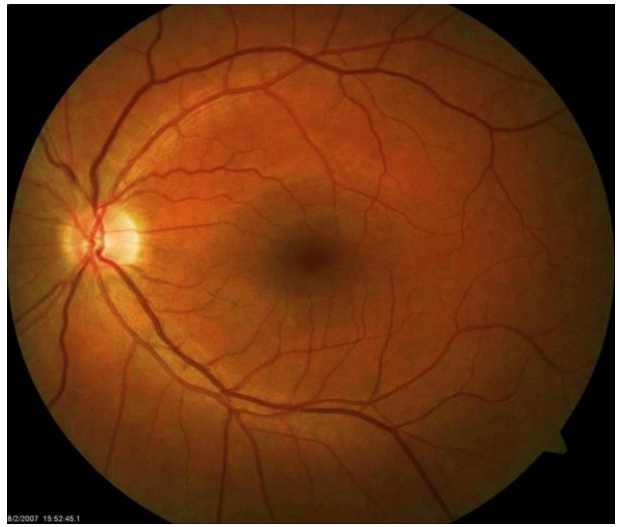


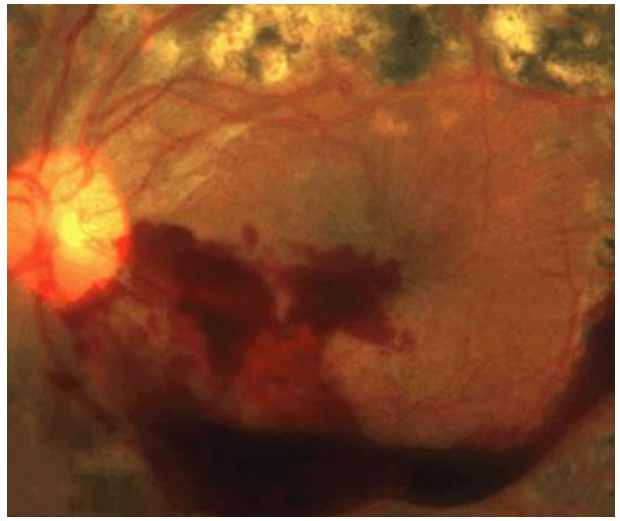
Males had the worse QOL compared with females
No statistically significant association with marital status.

Worse QOL
Patients in their first 1-5 years of diagnosis
diabetes> 20 years had the worse QOL.

Poor QOL in patients with
severe visual impairment
lower socioeconomic status

Higher QOL in patients who were compliant with
hypertensive meds (p=0.56)
exercise (p=0.21)
special diet (p=0.1)





- HOW DO WE PREVENT THIS JOURNEY FROM SIGHT TO BLINDNESS

EARLY DETECTION BY

- **DIABETIC RETINOPATHY SCREENING**

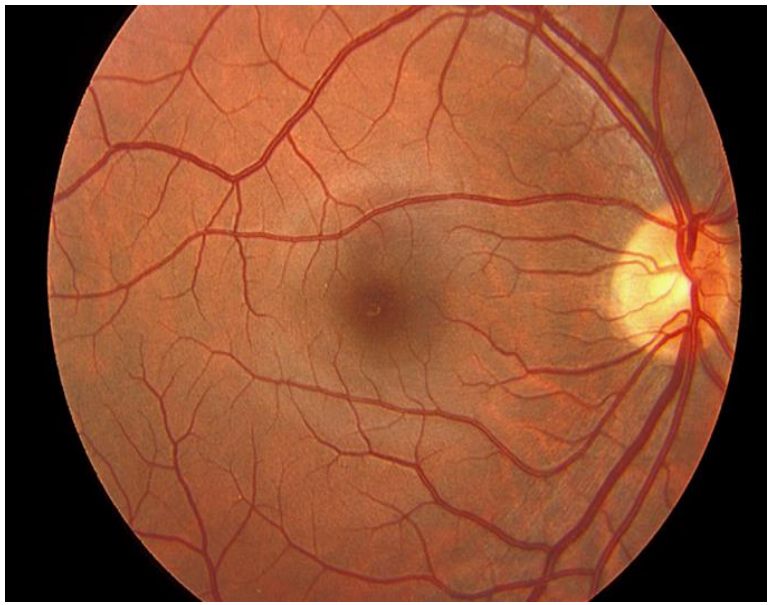
DIABETIC RETINOPATHY SCREENING (DRS)

- EARLY REFERRAL

Patient Education:

- CHANGE IN LIFESTYLE – TO REDUCE THE RISKS

HOW TO SCREEN?

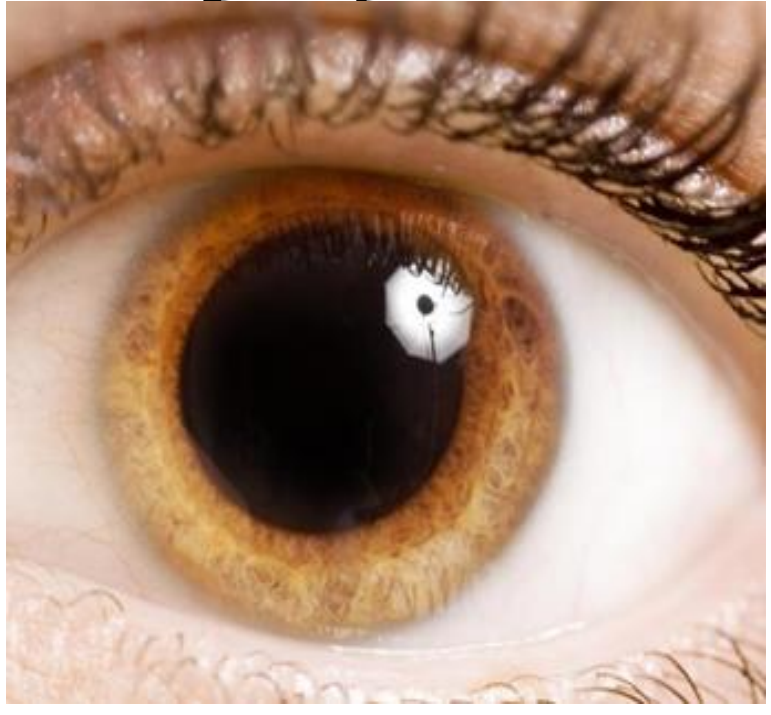


Diabetic Retinopathy Prevention

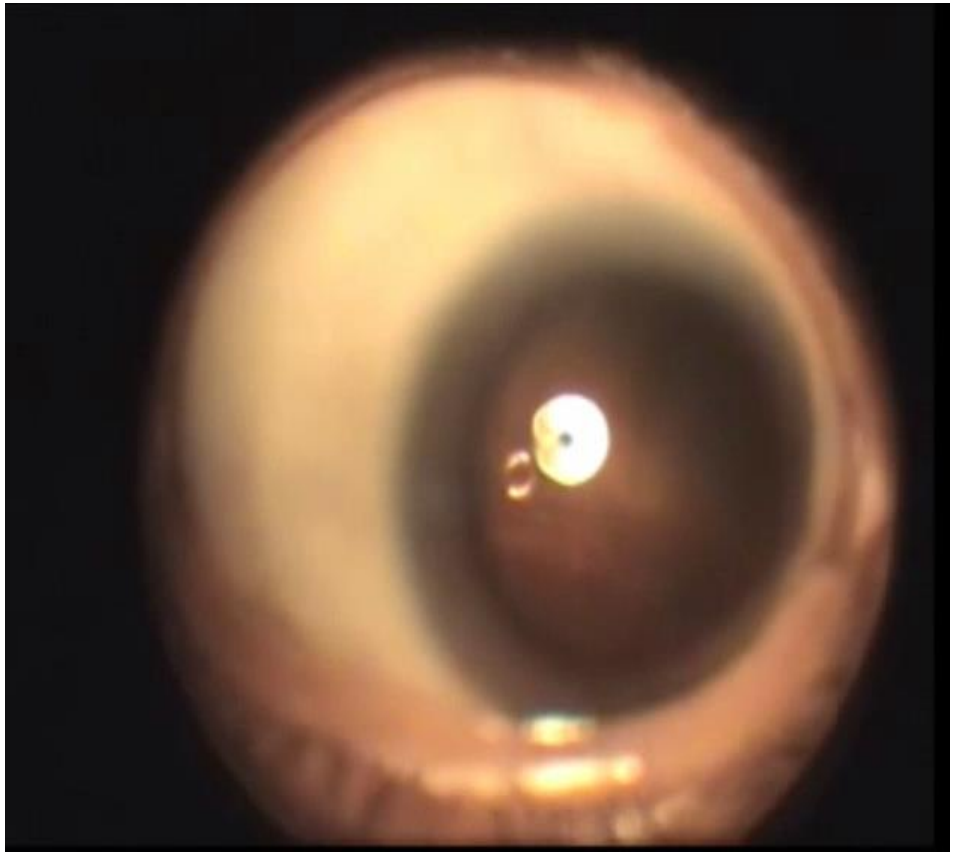
- Screening with dilated eye exam
- To properly examine the retina the eyes (pupils) must be DILATED with drops

DILATED EYE EXAMINATION

(at least once a year)

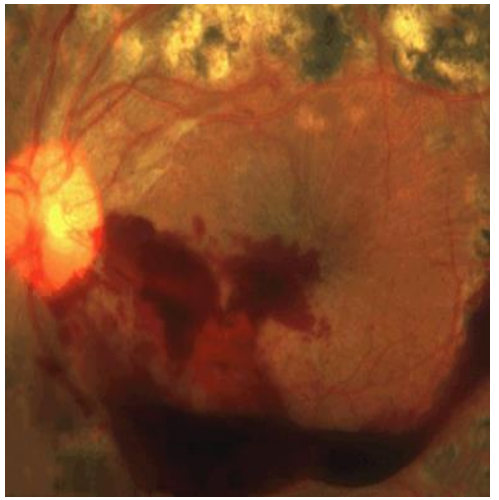


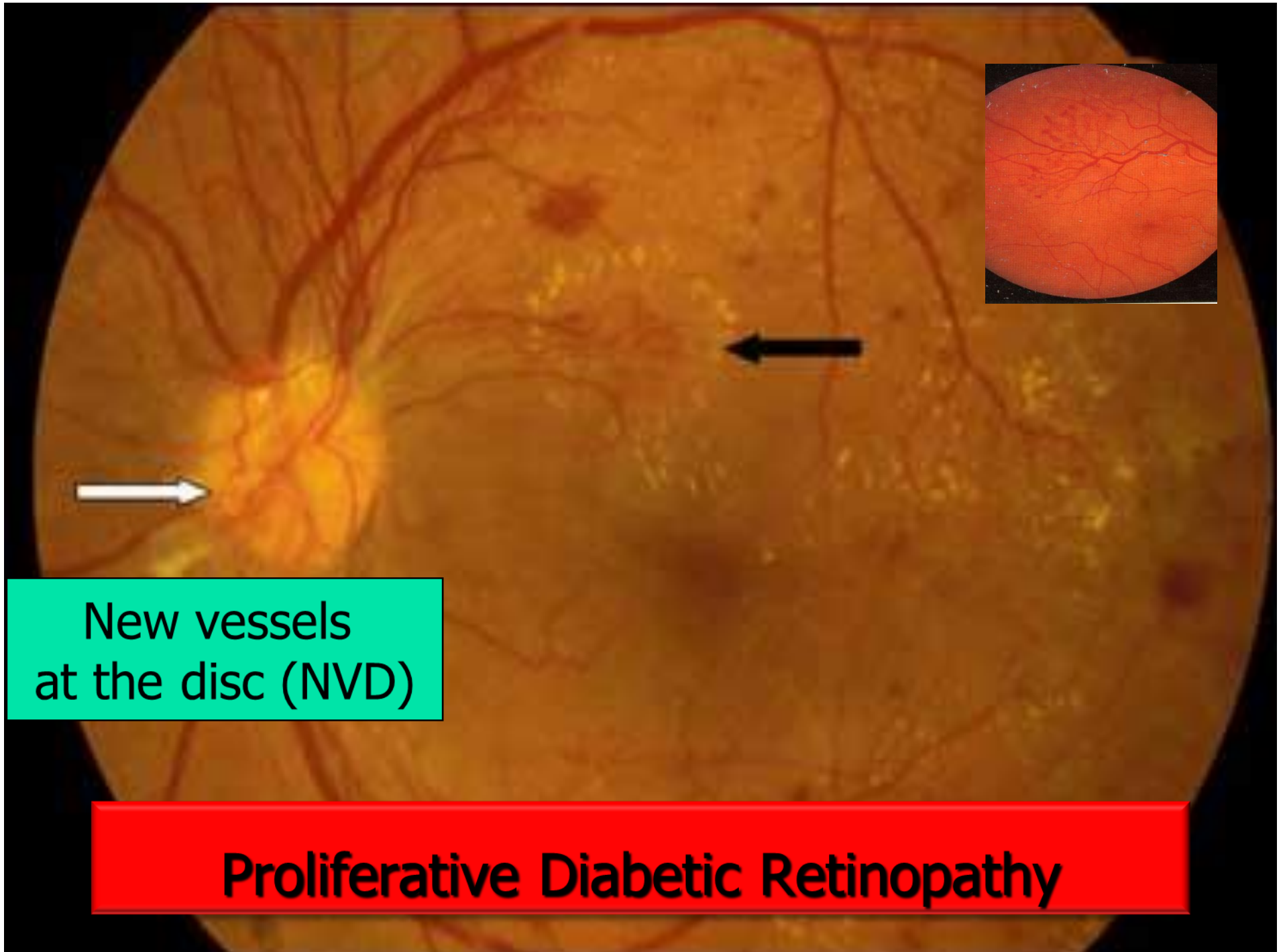
Fundus Photography



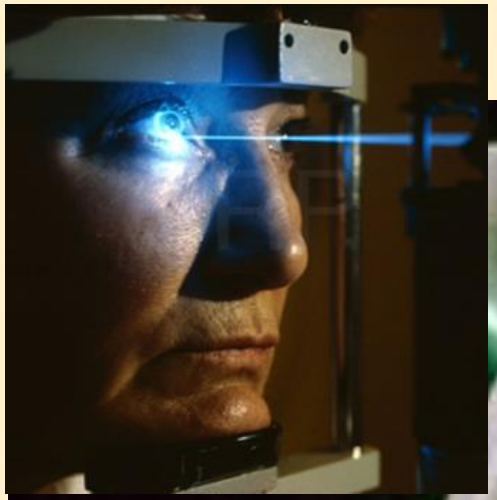
Diabetic Retinopathy

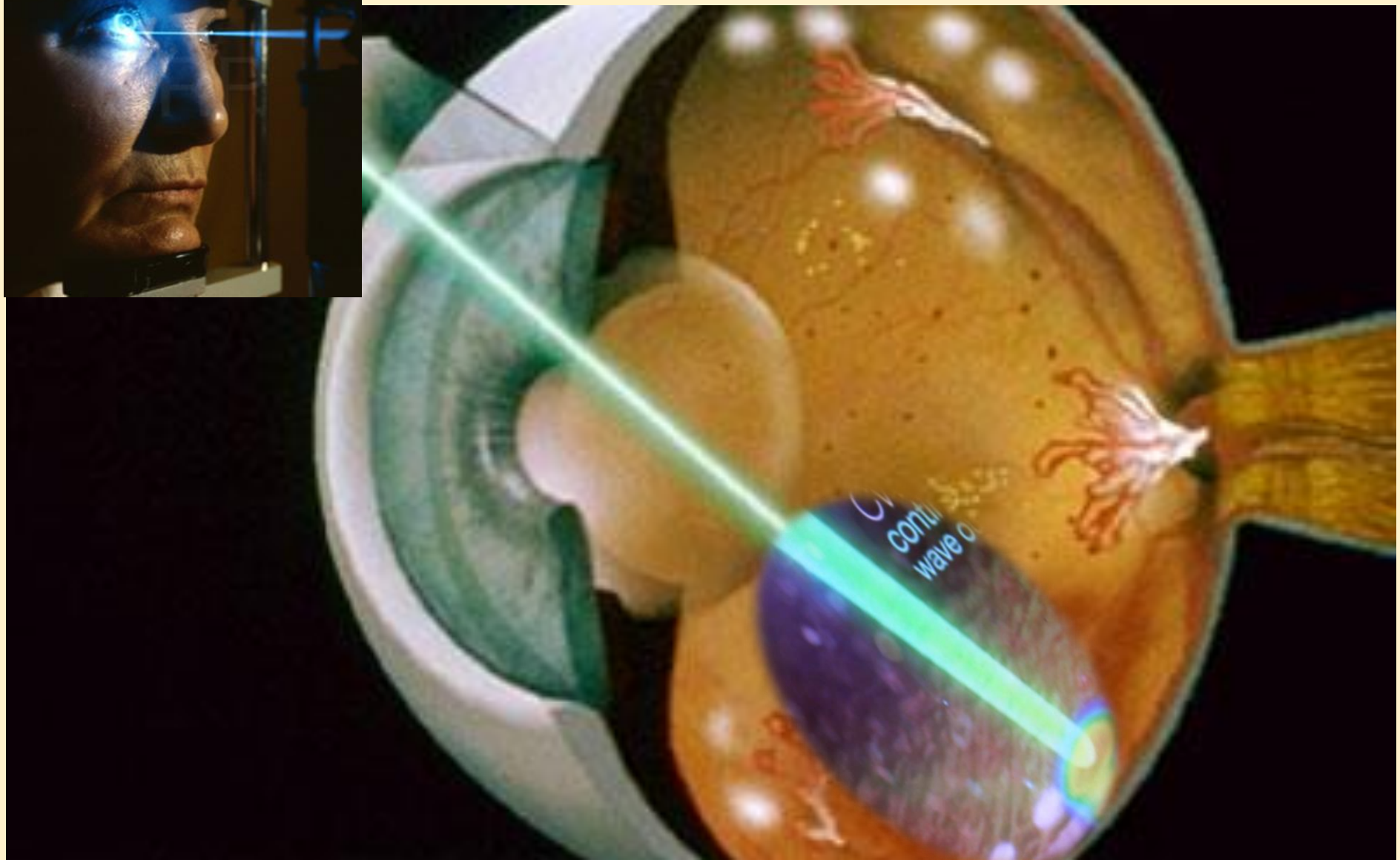
- Used to be the number 1 cause of blindness in the working age group in the UK
- With the introduction of Screening, it is now the number 2 cause of blindness
- REFERRAL TO AN EYE SPECIALIST should be from the time of Diagnosis
- ALL DIABETICS must have an annual dilated eye exam
- Diabetic Retinopathy is Preventable with regular screening!



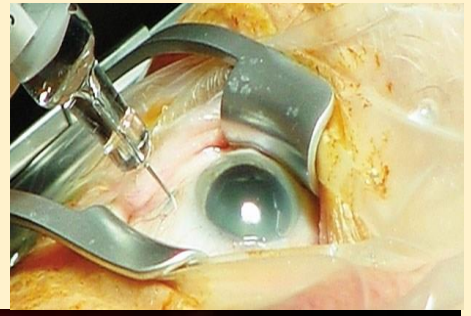

New vessels
at the disc (NVD)
Proliferative Diabetic Retinopathy

Laser treatment



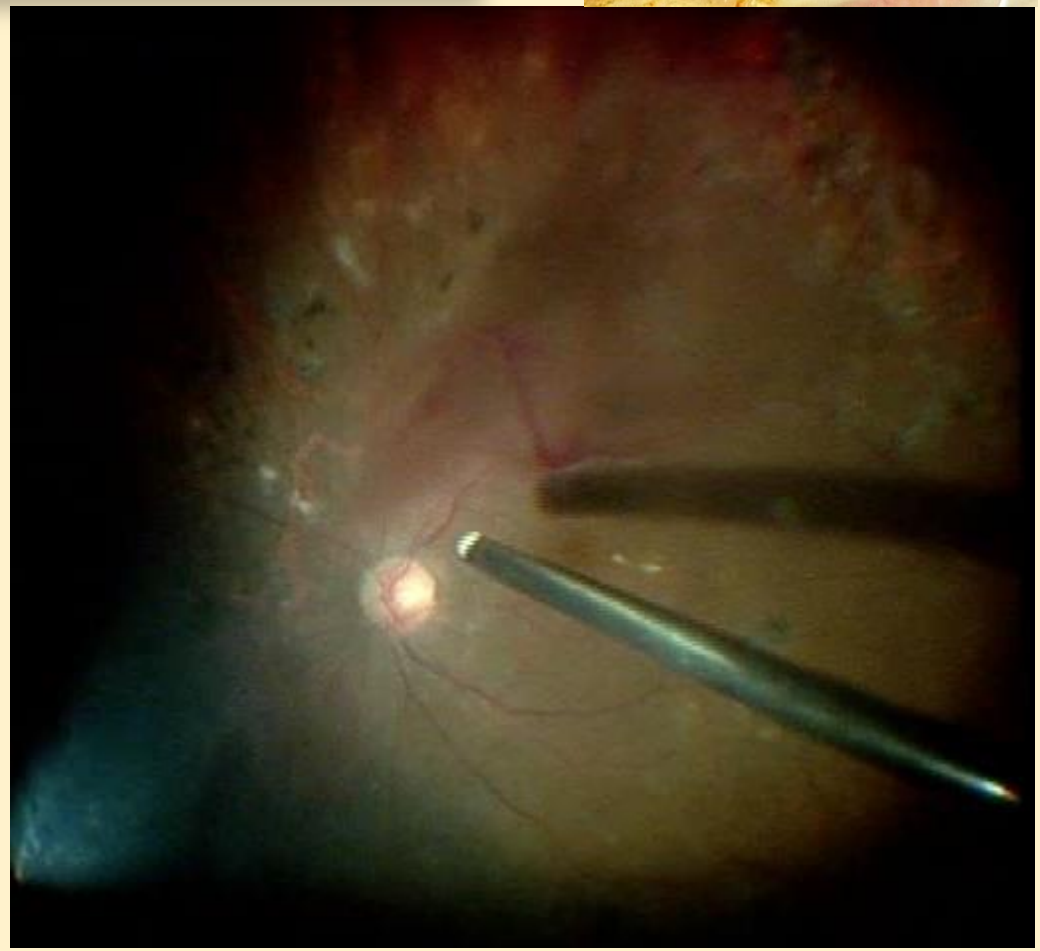


TREATMENT OPTIONS

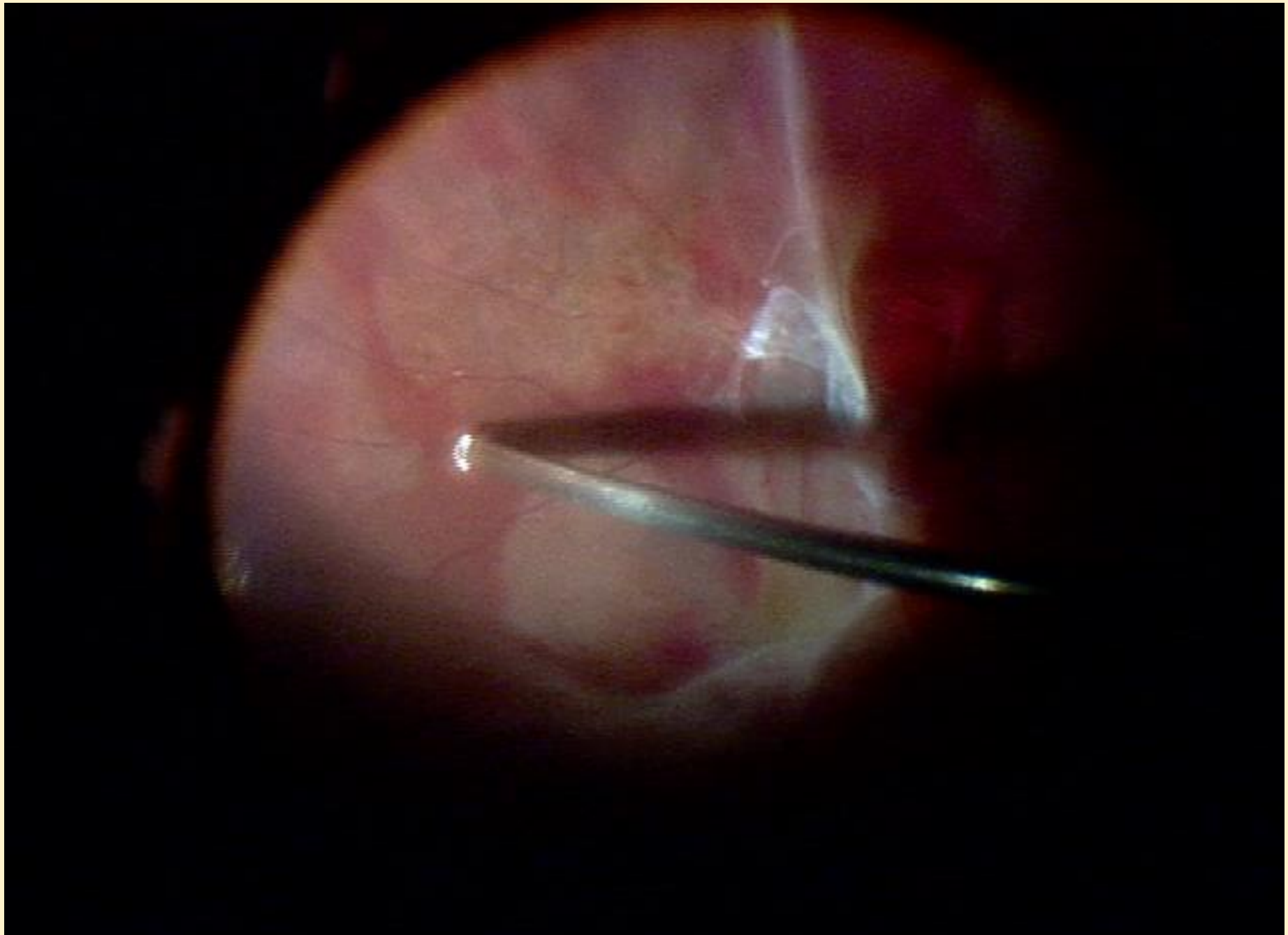


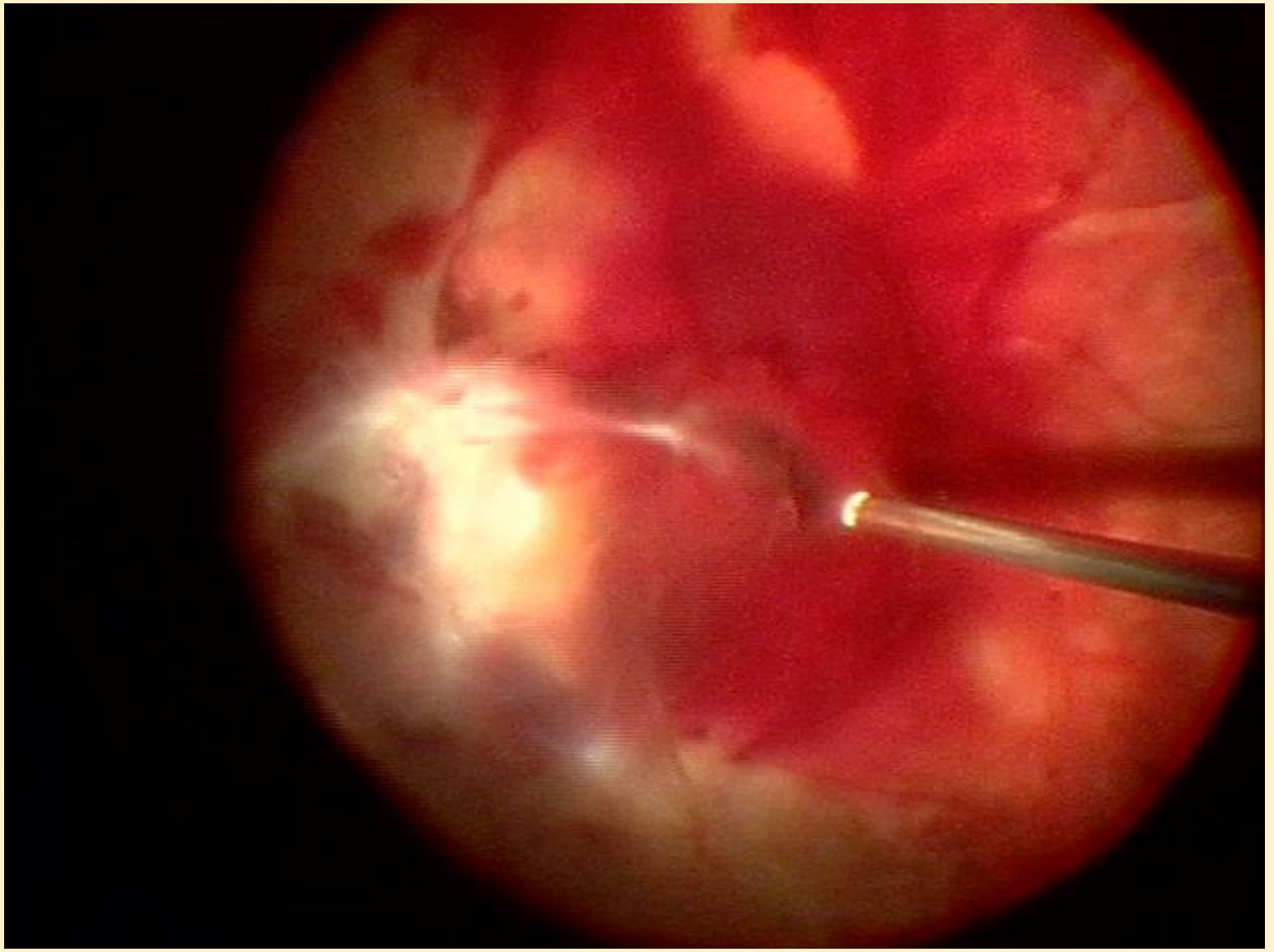
LASER

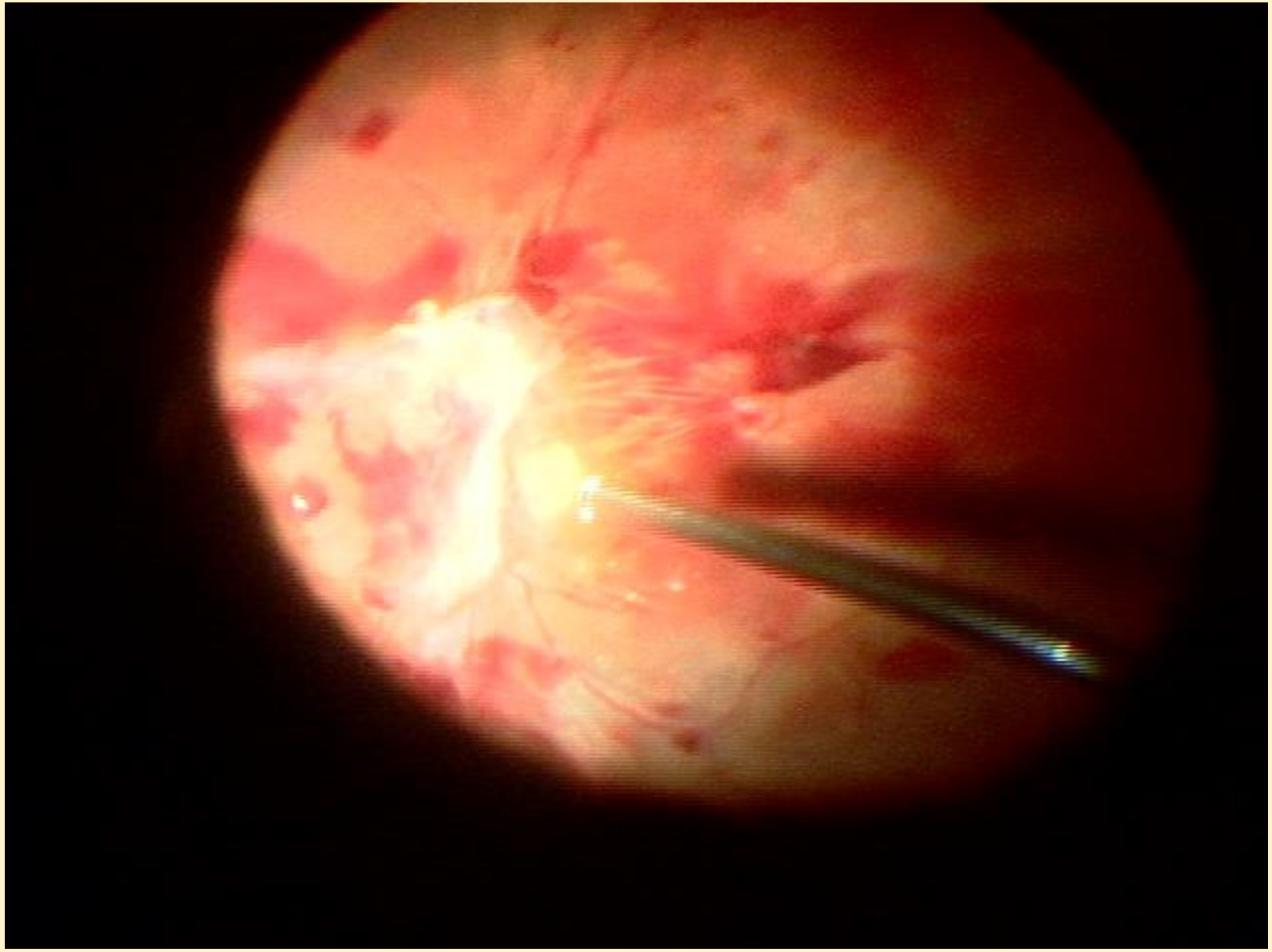
INJECTIONS:
Anti VEGF



SURGERY: Vitrectomy

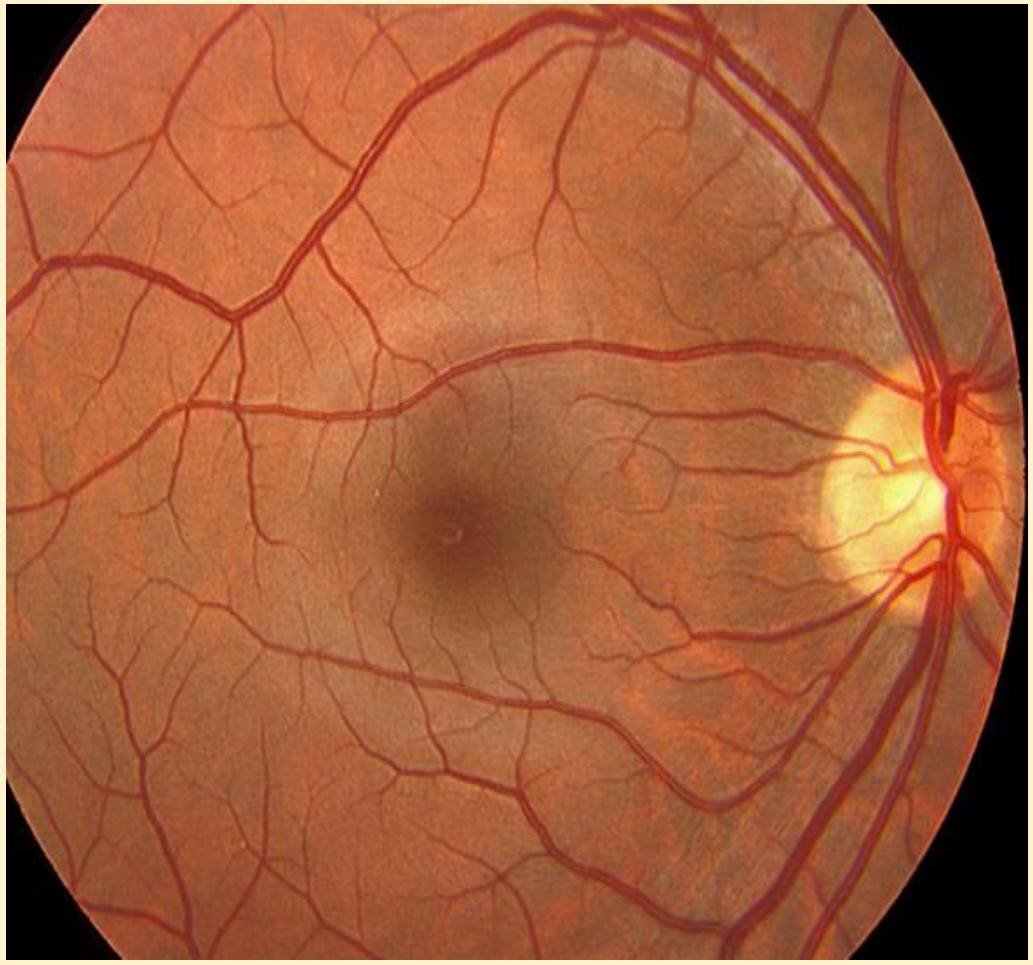


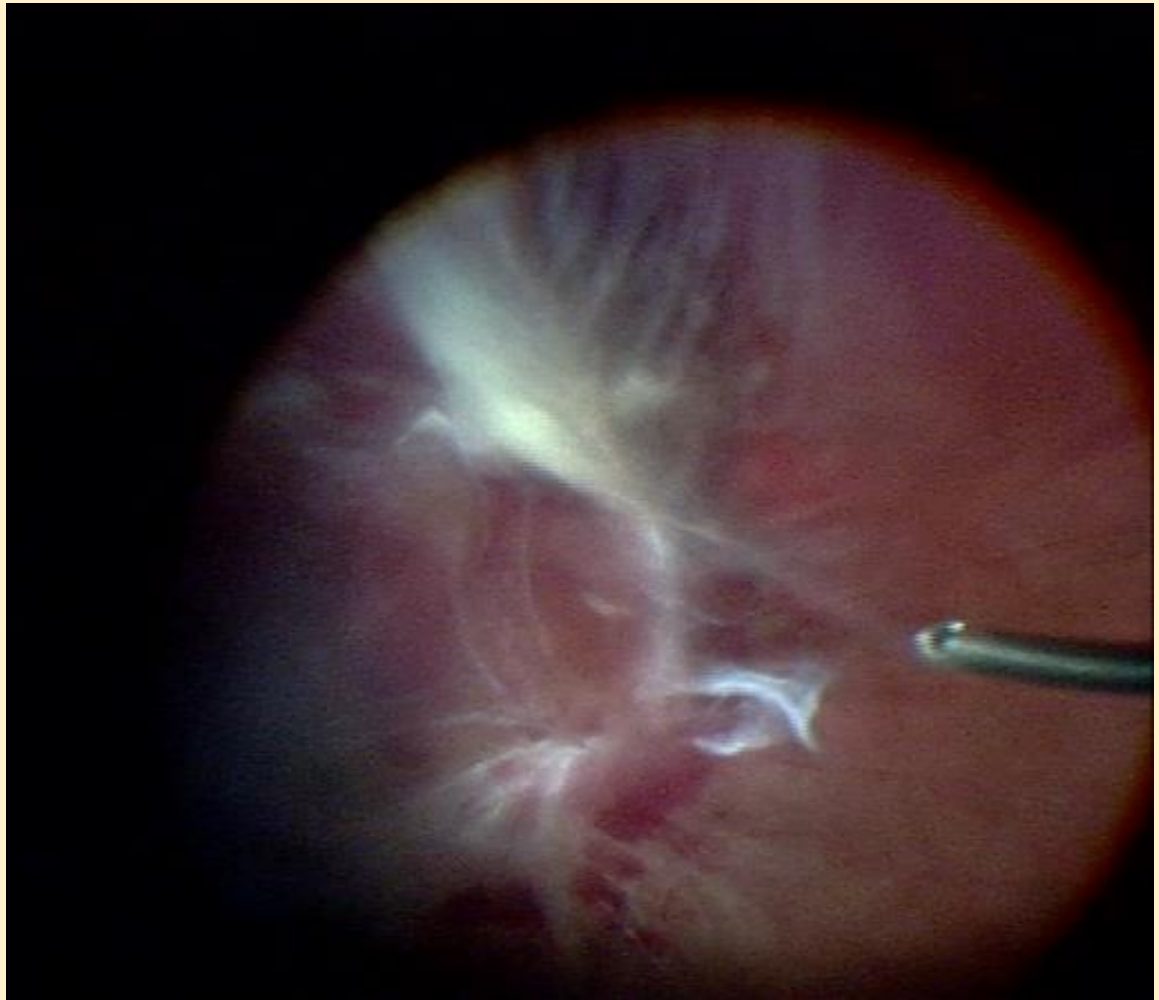




VITRECTOMY

- New technologies
- Intraocular tamponade agents
  - Gas/ Silicone Oil





Diabetic Retinopathy in Jamaica

Jamaica has significant visual morbidity from diabetic retinopathy

Particularly our Type I IDDM (males), high risk of visual loss

Retinopathy worsens with poor glucose and BP control

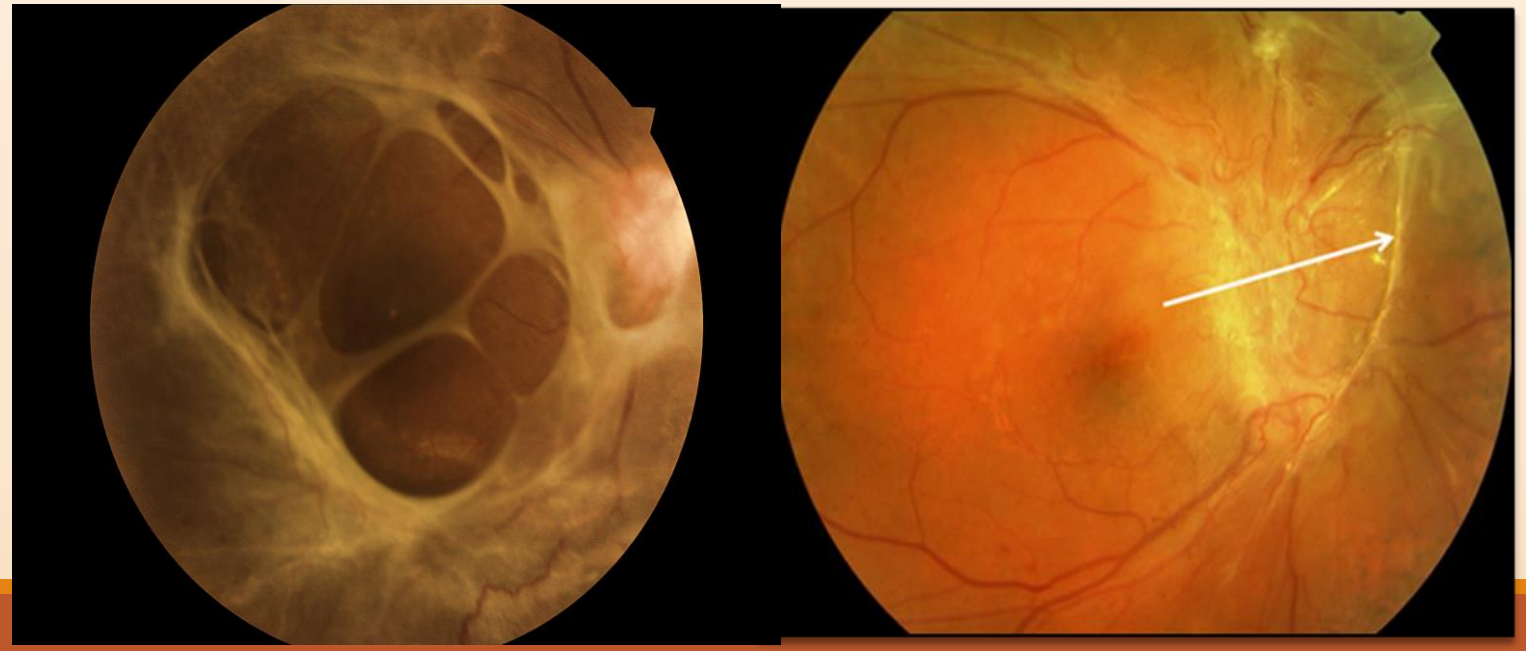
Our Jamaican patients are more likely to have:

- Uncontrolled glucose
- Uncontrolled hypertension
- Elevated HBA1C/Higher BMIs (previous study)

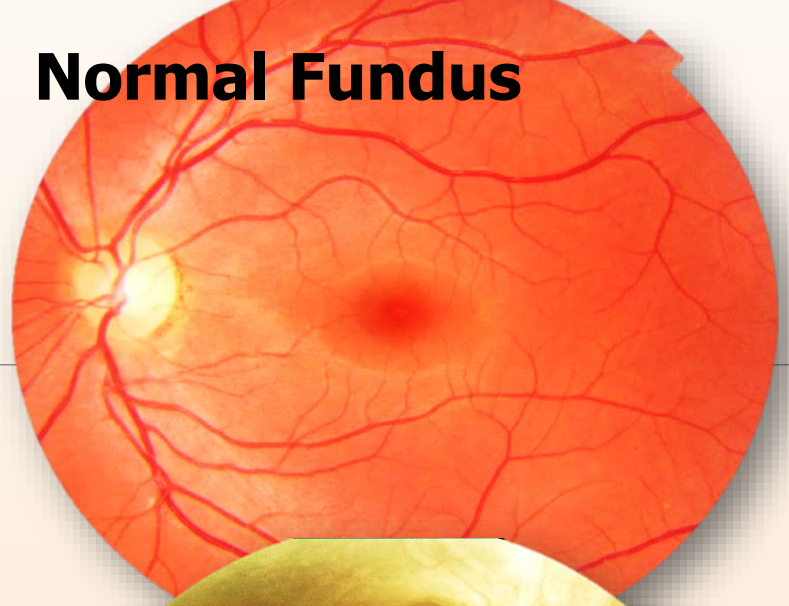
Burden of Diabetic Retinopathy

The burden/cost of the disease is heavy for an underdevelopment country:

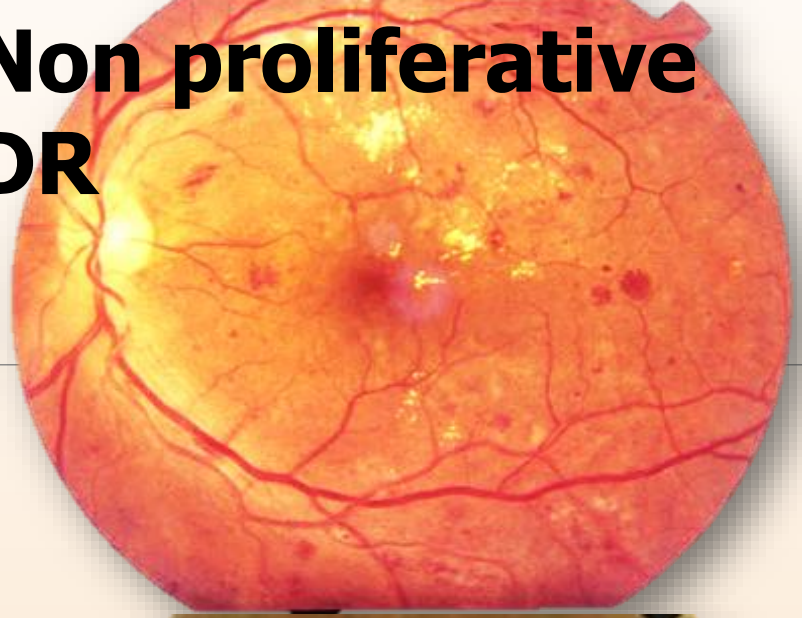
- Cost to hospital [purchase and maintain expensive equipment (lasers/Sx)]
- Cost to patient and society/impact of visual impairment
- Loss of hours from work/loss of work (patient/caregiver)
- Patient impact:
  - Quality of life
  - Socioeconomic status
  - Psychological wellbeing

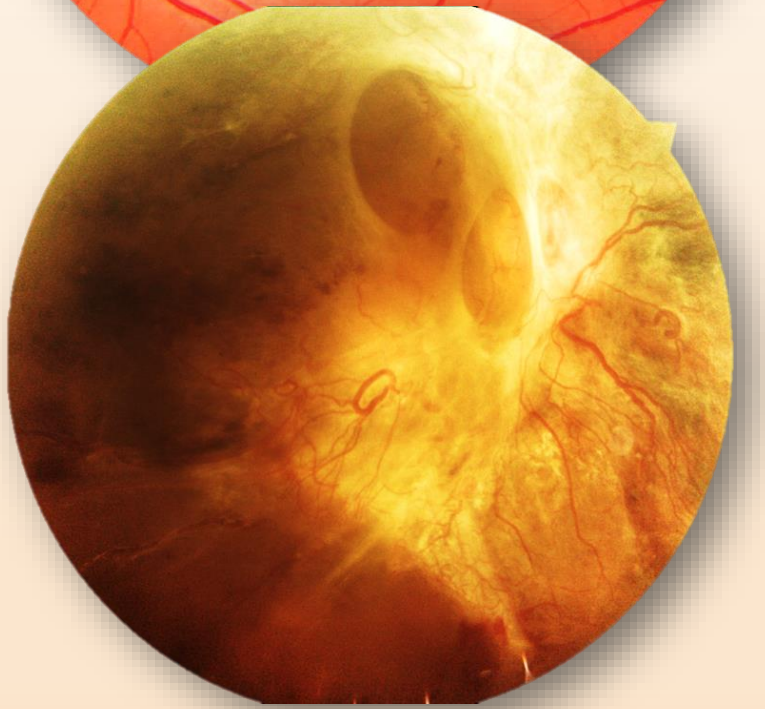


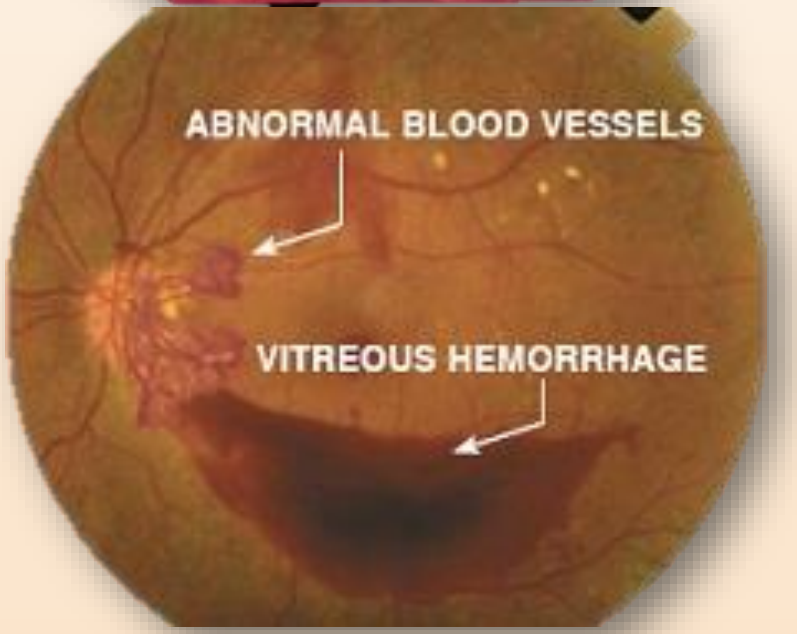
Normal Fundus



Non proliferative DR



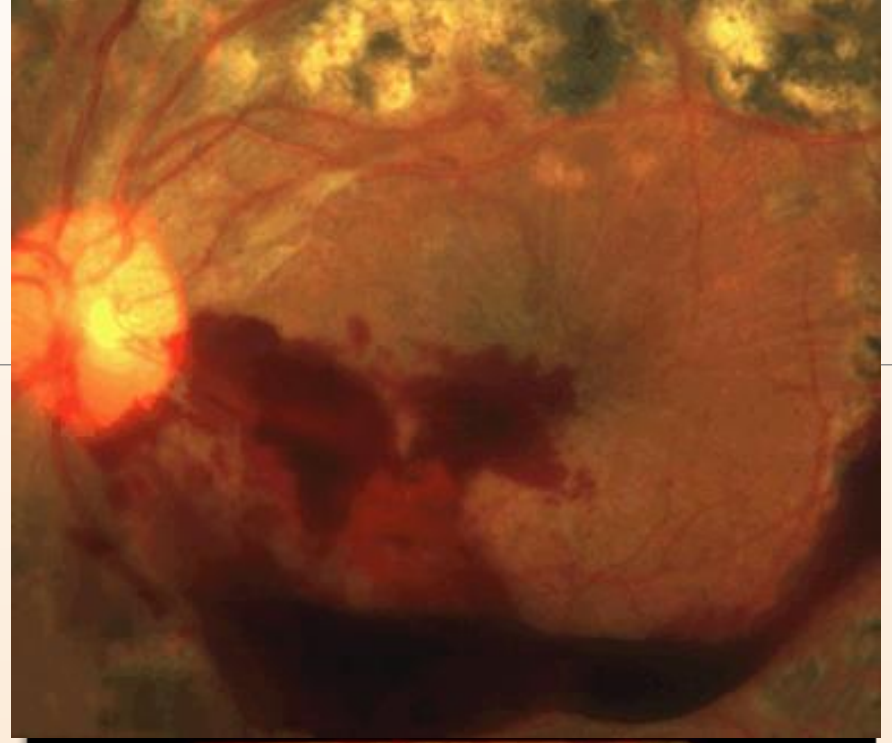


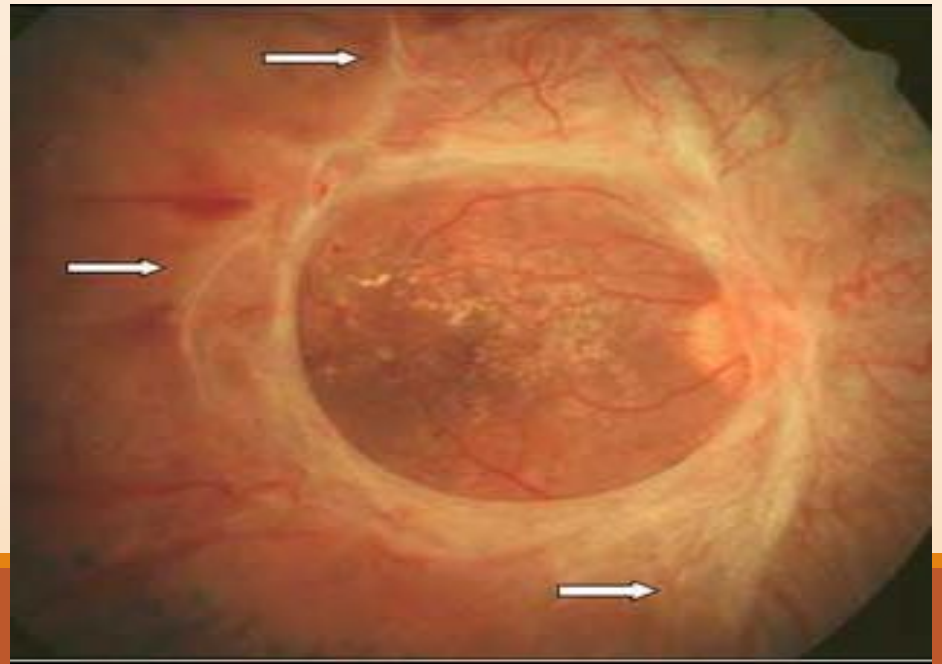


PROLIFERATIVE DIABETIC RETINOPATHY

Tractional RD

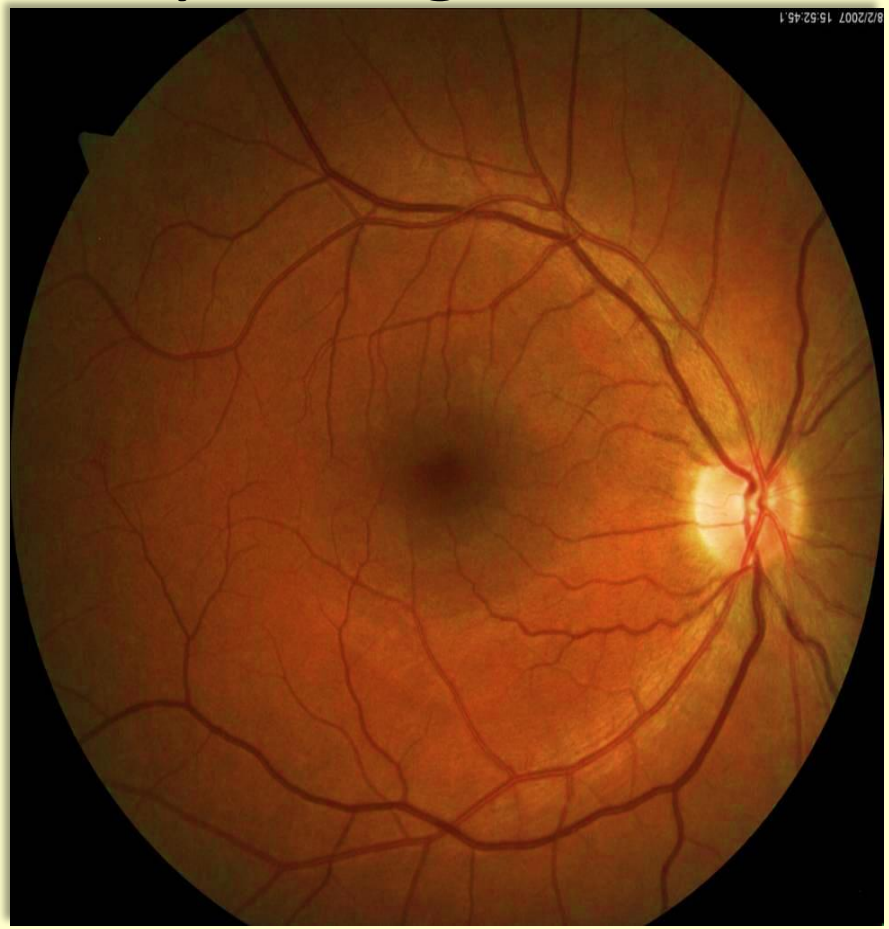
Vitreous Haemorrhage

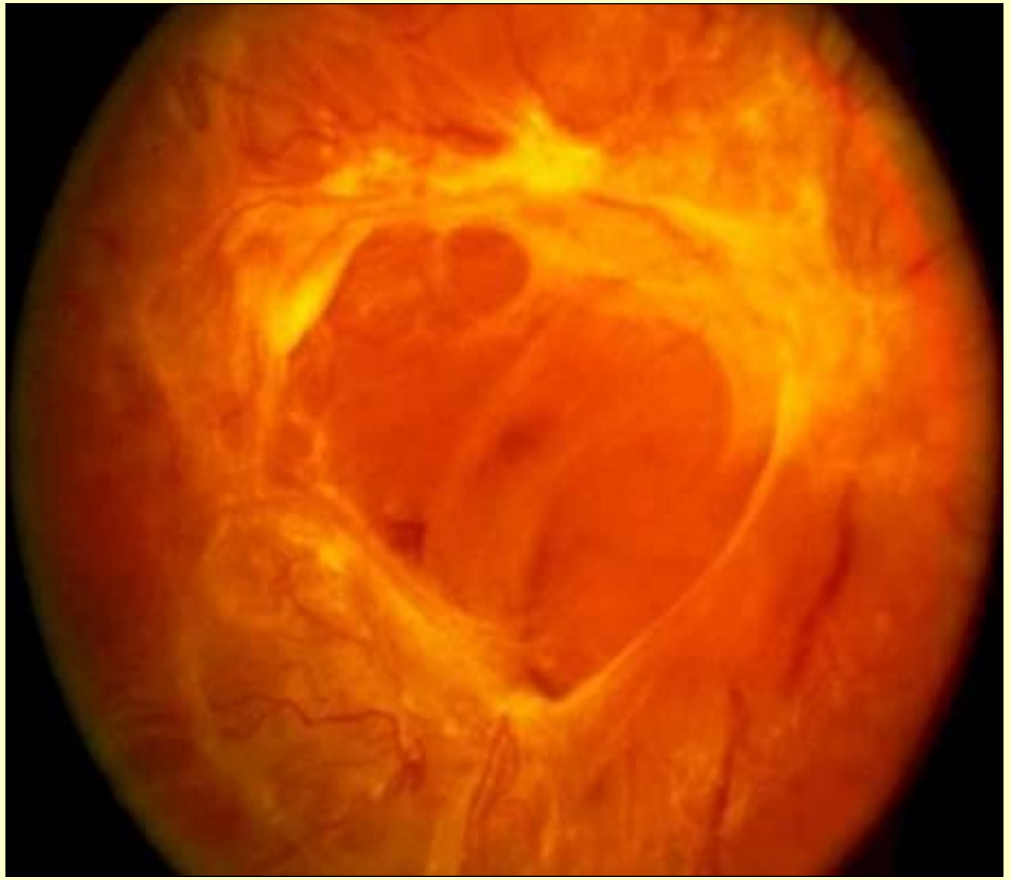




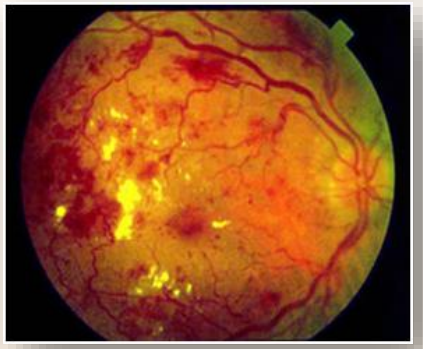
The journey from vision to blindness can be prevented with

- Diabetic retinopathy screening
- Education
- Policy changes to make it easier for the diabetic patient





SUMMARY



Jamaica's efforts should be aimed towards:

Diabetic Retinopathy is a blinding disease BUT an avoidable one

- Patient education on diabetic control
- Controlling the modifiable risk factors

  (glucose, BP, obesity & dyslipidemia)
- This requires a team approach

- Diabetes eye screening (early detection/referral/timely intervention)

Questionnaire

Knowledge, beliefs and practices of the Diabetic patient

Questions 1-18 (Please indicate with a tick [√] your correct answer)

	Yes	No
1. Do you think that Diabetics should have an eye exam at least once a year?		
2. Do you think that diabetics should see their eye doctor only when they have an eye problem?		
3. If you did not have eye problems do you think that you need to see an eye doctor once a year?		
4. Do you think diabetes can make you blind?		
5. Do you think that if your blood sugar is always high ,it can cause blindness?		
6. Do you feel that diabetes is the cause of your poor vision? (If vision worse than 6/36)		
7. Do you feel that regular exercise is important?		
8. Do you exercise regularly?		
9. Do you smoke?		
10. Do you think that you should have a special diet?		
11. Do you have a special diet?		
12. Do you think that it is important to take your diabetes medication every day?		
13. Do you think that it is important to take your blood pressure medication every day?		
14. Do you take your blood sugar medication every day?		
15. Do you take your blood pressure medication every day?		
16. Do you think that diabetes can be controlled with cinnamon or herbal remedies alone?		
17. Do you understand what diabetes is?		
18. Have you ever seen a dietician?		

For each question, please circle the best answer (For Questions 19-24)

19. Who is the best person to do your eye examination for diabetes?
    1. Health care worker
    2. Family doctor
    3. Optician
    4. Optometrist
    5. Ophthalmologist

20. In order of importance would you prefer to spend money on
    1. Nice clothes
    2. Patty & Soda
    3. Glucometer
    4. Healthy food
    5. Medications

21. When do you feel that a diabetic patient should first see an eye doctor?
    1. Not necessary
    2. When they need glasses
    3. Only if they are referred
    4. When the vision goes bad
    5. At time of diagnosis

22. Which choice applies to you. My Diabetes is controlled
    Rarely Most of the time All of the time

23. Do you have any of the following additional eye conditions
    Glaucoma Cataract

24. Indicate which of the following conditions apply to you
    Hypertension High cholesterol Heart disease Kidney disease Obesity

Please write your answer below (Questions 25-28)

25. In the past year how often did you visit a general practitioner for follow up of Diabetes?_____

26. In the past year how many times were you admitted to hospital because of uncontrolled Diabetes?_____

27. In the past year, how many times have you seen an ophthalmologist (Eye Doctor)?_____

28. In the past year how many times have you missed an eye clinic appointment?_____

Impact of visual impairment and quality of life on Diabetics at UHWI

PART 1: Effect of visual impairment on quality of life

(Questions 1-14) (Please indicate with a tick [V] your correct answer)

How much time during the past month...

	Not at all 1	A Little 2	Some of the Time 3	Most of the Time 4	Always 5
1. Have you been unhappy with your general health problems?					
2. Have you been unhappy with your vision?					
3. Have you needed a lot of help from others because of your eyesight					
4. Do you worry about your vision?					
5. Do you feel burdened by your health problems?					
6. Do you worry about embarrassing yourself because of poor vision?					
7. Do you stay home most of the time because of your vision?					
8. Does your vision prevent you from working?					
9. Do you think your vision affects your social life?					
10. Do you think your vision affects your close personal relationships OR having close personal relationships? (spouse/partner)					
11. Do you think your vision affects your relationship with your children? (Indicate if no children)					
12. Does your vision affect your enjoyment of eating food?					
13. Are you concerned about your hairstyle/how you dress?					
14. Do you fear being trapped in a fire?					

Difficulty level in doing tasks

Questions 15-29 (Please indicate with a tick [V] your correct answer)

	None 1	Little Difficulty 2	Some Difficulty 3	Very Difficult 4	Can't do at all 5
15. Seeing the details of a person's face					
16. Reading the Newspaper					
17. Filling out forms					
18. Watching TV or a movie					
19. Seeing to eat food					
20. Seeing bus numbers					
21. Seeing to cook					
22. Sewing					
23. Picking out and matching clothing					
24. Navigation(Moving around)					
25. Going down stairs in dim light					
26. Driving during the day					
27. Driving during the night					
28. Reading street or shop signs					
29. To choose your street clothes					