

Role of Family Physician in Screening of Diabetic Retinopathy

Thesis

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Abstract

Diabetic retinopathy is a sight-threatening microvascular complication of diabetes. The family physician is responsible for increase health awareness for diabetic patients about prevention and early detection of diabetic retinopathy for proper management and follow-up. The objectives of this study were to assess the awareness of diabetic patients about the screening for diabetic retinopathy and to identify the factors associated with the attendance and non-attendance of patients for diabetic retinopathy screening.

This study is a cross sectional study in which 100 diabetic patients were interviewed and ophthalmological assessment was done.

It was found that there is general awareness of diabetic retinopathy amongst a majority of diabetic patients; however there is a little awareness about the importance of the screening. The main barrier for performing the fundus examination was the lack of the awareness about the importance of it.

Awareness creation is the corner-stone of any program aimed to reducing Diabetic Retinopathy. Health insurance is needed to cover all diabetic patients to help in the screening coverage.

Key words: diabetic retinopathy, awareness, fundus examination, screening.

List of Contents

Abstract	I
List of Abbreviations	II
List of Tables	IV
List of Figures	VI
Introduction	1
Aim of the work	3
Review of literature:	
Chapter 1: Retinal Anatomy.	4
Chapter 2: Pathophysiological Events in Diabetic Retinopathy.	8
Chapter 3: Lesions of Diabetic Retinopathy.	13
Chapter 4: Clinical Classifications (or Gradings) of Diabetic Retinopathy.	24
Chapter 5: Factors affecting Diabetic Retinopathy.	28
Chapter 6: Role of Family Physician in Prevention and Slowing the Progression of Diabetic Retinopathy.	45
Chapter 7: Diabetic Retinopathy Awareness Creation Approach.	60
Subjects and methods	63
Results	69
Discussion	98
Conclusions & Recommendations	114
Summary	116
References	119
Appendices	144
Arabic summary	A

List of Tables

List of tables in literature:	
Table A: International Clinical Diabetic Retinopathy Disease Severity Scale.	25
Table B: International Clinical Diabetic Macular Edema Disease Severity Scale.	25
Table C: English retinopathy classifications.	26
Table D: English maculopathy classification.	27
Table E: Simplified classification of diabetic retinopathy.	27
List of tables in results section:	
Table (1): Socio-demographic characters of the diabetic patients attending diabetic clinic in 2011.	69
Table (2): The age of onset and duration of diabetes of diabetic patients attending diabetic clinic (2011).	70
Table (3): Distribution of diabetic patients attending diabetic clinic regarding perceived glycemic control and it's relation to objective glycemic control (2011).	75
Table (4): Awareness of diabetic patients attending diabetic clinic in 2011 about the importance of frequent screening of DR and available treatment options for DR.	81
Table (5): Causes of patients' attendance for previous fundus examination and frequency of their fundus examination (diabetic clinic in 2011).	84
Table (6): The effect of age and gender on the awareness of diabetic patients attending diabetes clinic in 2011.	87
Table (7): The effect of education on the awareness of diabetic patients attending diabetic clinic in 2011.	88
Table (8): The relation between the patients' awareness and treatment of diabetes of the diabetic patients attending diabetic clinic in 2011.	89
Table (9): The relation between the patients' awareness and glycemic control (perceived & by tests) in diabetic clinic (2011).	90
Table (10): The effect of history of retinal affection and previous retinal laser or injection on the awareness of diabetic patients attending diabetic clinic in 2011.	91

Table (11): The relation between the patients' awareness and the time of 1 st fundus examination of the diabetic patients attending diabetic clinic in 2011.	91
Table (12): The effect of hypertension, ischemic heart disease and smoking on awareness of diabetic eye complications of diabetic patients attending diabetic clinic in 2011.	92
Table (13): The relation between diabetes family history and awareness in diabetic patients attending diabetes clinic in 2011.	93
Table (14): Effect of gender and smoking on diabetic retinopathy of diabetic patients attending diabetes clinic in 2011.	93
Table (15): The effect of some drugs on diabetic retinopathy of diabetic patients attending diabetes clinic (2011).	94
Table (16): The effect of glycemic control (by tests) on DR in diabetic patients attending diabetic clinic in 2011.	95
Table (17): The relation between hypertension and diabetic retinopathy in diabetic patients attending diabetic clinic in 2011.	96
Table (18): The relation between previous fundus examination and DR in diabetic patients attending diabetic clinic (2011).	96
Table (19): The relation between the time of 1 st fundus examination and DR in diabetic patients attending diabetic clinic in 2011.	97

List of Figures

List of figures in literature:	
Figure A: The retina.	5
Figure B: Normal fundus.	5
Figure C: The anatomic classification of areas of the posterior pole is contrasted with the clinical classification of retina.	6
Figure D: The peri-papillary retina shows the cellular layers from internal to external.	7
Figure E: Basement membrane thickening in a retinal arteriole.	8
Figure F: Pericyte loss in diabetic retinopathy.	9
Figure G: Two large microaneurysms in an area of acellular capillaries.	10
Figure H: large microaneurysms and some dot hemorrhages that border an ischemic, whitened zone of retina.	14
Figure I: Elongated lighter red flame hemorrhages and more oval and darker red blot hemorrhages.	14
Figure J: Small hemorrhages, microaneurysms, some of which are leaking shown by the fluffy edge.	15
Figure K: Hard exudates forming a ring pattern around a leaking microaneurysm.	16
Figure L: cotton wool spots.	16
Figure M: Intra-retinal microvascular abnormality (IRMA).	17
Figure N: A venous loop.	18
Figure O: A fluorescein angiogram showing venous beading adjacent to an ischemic area of retina.	18
Figure P: Neovascularization on the disc of the right eye.	20
Figure Q: New vessels elsewhere (NVE).	20
Figure R: sever vitreous hemorrhage.	21
Figure S: Pre-retinal hemorrhages.	21
Figure T: A large white sheet of fibro-vascular tissue is present on the surface of the retina with tractional retinal detachment.	22
Figure U: Confluent areas of chorio-retinal atrophy and scarring following pan-retinal photocoagulation.	22
Figure V: CSME with hard exudates in the fovea.	23
Figure W: Plot of the average number of patients who would develop severe vision loss by different screening strategy.	56

List of figures in results section:	
Figure (1): Distribution of the diabetic patients attending diabetic clinic (in 2011) regarding current treatment of diabetes.	71
Figure (2): Distribution of diabetic patients attending diabetic clinic in 2011 regarding Aspirin and vitamin B complex intake.	71
Figure (3): Distribution of diabetic patients attending diabetic clinic in 2011 regarding history of previous eye diseases.	72
Figure (4): Distribution of diabetic patients attending diabetic clinic in 2011 regarding history of previous eye surgery.	73
Figure (5): Distribution of diabetic patients attending diabetic clinic in 2011 regarding associated co-morbidity.	73
Figure (6): Distribution of diabetic patients attending diabetic clinic in 2011 regarding family history of diabetes.	74
Figure (7): Distribution of diabetic patients attending diabetic clinic (2011) regarding glycemic control.	75
Figure (8): Distribution of diabetic patients attending diabetic clinic in 2011 regarding their visual acuity.	76
Figure (9): Distribution of diabetic patients attending diabetic clinic in 2011 regarding their anterior segment examination.	77
Figure (10): Distribution of diabetic patients attending diabetic clinic in 2011 regarding diabetic retinopathy.	77
Figure (11): Distribution of diabetic patients attending diabetic clinic in 2011 regarding diabetic maculopathy.	78
Figure (12): Awareness of the diabetic patients about complications of diabetes (diabetic clinic in 2011).	79
Figure (13): Awareness of diabetic patients about the effect of diabetes on the eye (diabetic clinic in 2011).	79
Figure (14): Awareness of the diabetic patients attending diabetic clinic about the importance of screening of DR (2011).	80
Figure (15): Source of the diabetic patients' knowledge's (diabetic clinic in 2011).	82
Figure (16): Diabetic patients' previous attendance for fundus examination (diabetic clinic 2011).	83
Figure (17): Causes of patients' non-attendance for the screening of DR of the diabetic patients attending diabetic clinic in 2011.	86

List of Abbreviations

2Hpp: 2 Hour Post Prandial.

A/V: Arterio-Venous.

AAO: American Academy of Ophthalmology.

ACE inhibitors: Angiotensin Converting Enzyme inhibitor.

ADA: American Diabetic Association.

CDA: Canadian Diabetes Association.

CSME: Clinically Significant Macular Edema.

DBP: Diastolic Blood Pressure.

DCCT: Diabetes Control and Complications Trial.

DD: Disc Diameter.

DM: Diabetes Mellitus.

DME: Diabetic Macular Edema.

DR: Diabetic Retinopathy.

DRSR: Diabetic Retinopathy Study Research.

EDIC: Epidemiology of Diabetes Intervention and Complications.

ETDRS: Early Treatment Diabetic Research Study.

FBS: Fasting Blood Sugar.

FPD: Fibrous Proliferation at the Disc.

FPE: Fibrous Proliferation Elsewhere.

HbA_{1c}: Glycosylated Hemoglobin.

HDL: High Density Lipo-proteins.

HMa: Hemorrhage/Micro-aneurysm.

IDDM: Insulin Dependent Diabetes Mellitus.

IDF: International Diabetes Federation.

IRMA: Intra-Retinal Microvascular Abnormalities.

LDL: Low Density Lipo-proteins.

NHMRC: National Health and Medical Research Council.

NICE: the National Institute for Health and Clinical Excellence.

NIDDM: Non Insulin Dependent Diabetes Mellitus.

NPDR: Non Proliferative Diabetic Retinopathy.

NVD: New Vessels on Disc.

NVE: New Vessels Elsewhere.

OHD: Oral Hypoglycemic Drug.

PDR: Proliferative Diabetic Retinopathy.

PRH: Pre-Retinal Hemorrhage.

SBP: Systolic Blood Pressure.

T₁DM: Type 1 Diabetes Mellitus.

T₂DM: Type 2 Diabetes Mellitus.

UKPDS: United Kingdom Prospective Diabetes Study.

VA: Visual Acuity.

VH: Vitreous Hemorrhage.

WESDR: The Wisconsin Epidemiologic Study of Diabetic Retinopathy.

WHO: World Health Organization.

Introduction

Diabetes mellitus has emerged as a major health problem worldwide, with serious health and socioeconomic impact on individuals and populations. Also, the growth of diabetes is proliferating in overweight and obese adults and children **(Narayan et al, 2000; Wild et al, 2004)**.

The International Diabetes Federation (IDF) estimates that there are 285 million people with diabetes worldwide in 2010, and the number will be 438 million in the coming twenty years.

Egypt currently stands at number 10 in the list of countries with the highest number of Diabetic cases. The Diabetic population in Egypt was estimated at 4,787 million in 2010 and it is projected to reach 8,615 million by the year 2030 with Egypt ranking 9th in the IDF list **(IDF, 2009)**.

Diabetic retinopathy is microvascular complication of diabetes. It develops in nearly all persons with type 1 diabetes and in more than 77% of those type 2 who survive over 20 years with the disease. WHO has estimated that DR is responsible for 4.8% of the 37 million cases of blindness throughout the world **(Resnikoff, 2004)**.

Primary care in the community forms an integral part of health care in most countries and is the first level of contact for most people with diabetes. The family physician is responsible for increase health

awareness for diabetic patients about prevention and early detection of DR for proper management & follow-up **(Ramaiya, 2006)**.

Rationale:

The WHO definition of screening in 1968 was the presumptive identification of unrecognized disease or defect by the application of tests, examinations or other procedures which can be applied rapidly **(Wilson & Jungner, 1968)**.

Applying this definition to DR demonstrates that it is a very suitable condition for screening; sight-threatening DR is an important public health problem **(Kocur & Resnikoff, 2002; Kempen et al, 2004)**, the incidence of sight-threatening DR is becoming a great public health problem; IDF has predicted a worldwide increase in diabetes and DR **(IDF, 2009)**, sight-threatening DR has a recognizable latent stage **(ETDRS, 1991a; Stratton, 2001)**, laser treatment for sight-threatening DR is effective and agreed universally **(ETDRS, 1987; DRSR, 1979)**, favorable long-term visual results have been reported **(Chew et al, 2003)**, a suitable and reliable screening test is available for sight-threatening DR, and is acceptable to both health care professionals and to the public **(Olson et al, 2003; Scanlon et al, 2003)** and the costs of screening and effective treatment of sight-threatening DR balance economically in relation to total expenditure on health care, including the consequences of leaving the disease untreated **(Javitt & Aiello; 1996; Williams et al, 2004)**.

Aim of the Work

✓ **Goal:**

Prevention and early detection of diabetic retinopathy in diabetic patients.

✓ **Objectives:**

1. To assess the awareness of diabetic patients about the screening for diabetic retinopathy.
2. To identify the factors associated with the attendance and non attendance of patients for diabetic retinopathy screening.

Retinal Anatomy

The retina is a translucent tissue lining the inside posterior 2/3 of the eye, extending from the macula to the ora serrata **(Hogan et al, 1971)**.

It is a highly specialized, neurosensory tissue that develops from an extension of the central nervous system during embryogenesis. Retinal tissue translates focused light energy into a complex series of electrical impulses transmitted through the optic nerve, optic chiasma and visual tracts to the occipital cortex, resulting in the perception of vision **(Douglas et al, 2005)**.

Retina is attached firmly at the disc and ora and is contiguous with the axons of the optic nerve and the non-pigmented epithelium of the pars plana **(Figure A)**. Externally, there exist weak attachments to the retinal pigment epithelium (RPE) via interdigitation between the RPE cells and photoreceptor outer segments. There are firm internal attachments to the vitreous at the optic nerve, macula, retinal vessels and vitreous base **(Michael et al, 2010)**.

The optic nerve is a key landmark that is important for the examining physician to identify during ophthalmoscopy. The optic nerve lies just nasal to the fovea. The optic nerve is approximately 1.5 to 1.9 mm in diameter and a retinal vein on the surface of the nerve is approximately 125 mm in diameter. The arteries appear thinner and more orange-red, whereas the veins are larger and more crimson **(Douglas et al, 2005)**.

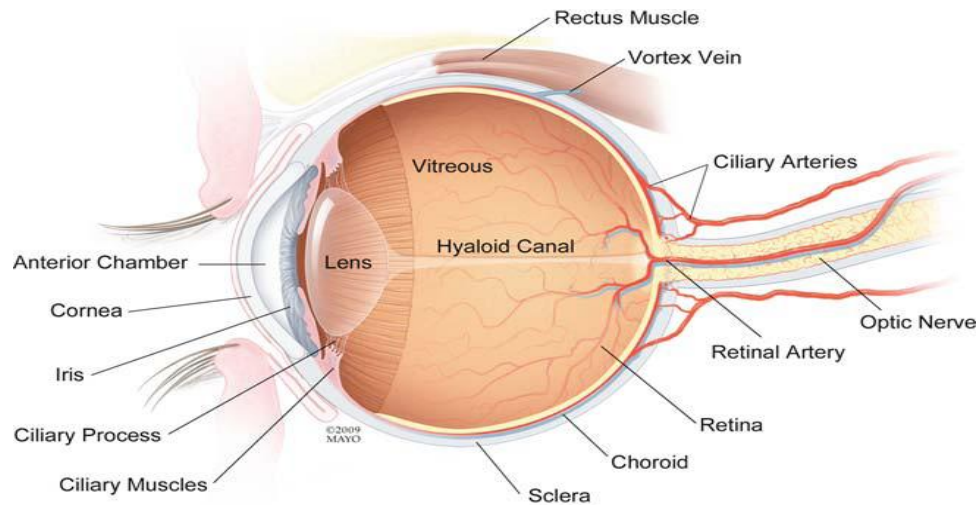


Figure A: The retina (yellow in cross section) emanating from the optic nerve at the right, lining the inside surface of the choroid (red and blue), and terminating at the ora serrata (**Michael et al, 2010**).

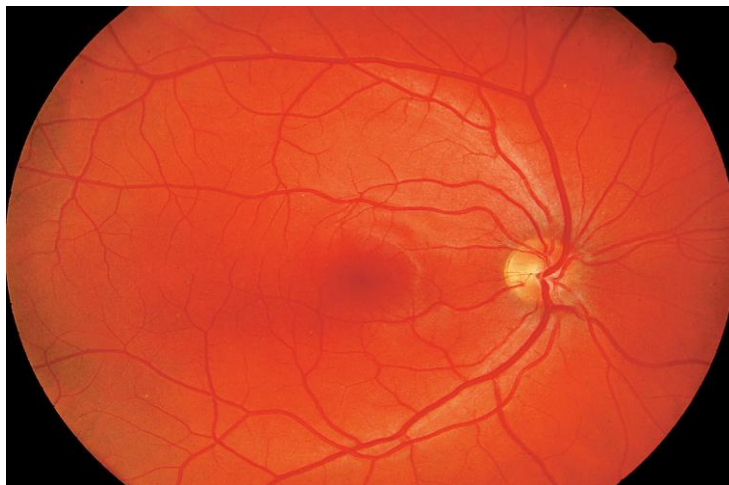


Figure B: Normal fundus, cup-to-disc ratio of 0.1, normal arterial-to-venous diameter ratio of 7:10 (**Douglas et al, 2005**).

The normal ratio of arterial to venous diameter (A:V ratio) is approximately 7:10 or 8:10 (i.e., the retinal artery diameter is 70% to 80% of the apparent diameter of the adjacent vein) (**Figure B**). The A: V ratio is best judged by comparing vessel calibers after the initial branch point. As