

OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHIC NORMATIVE DATA FOR MACULAR PERFUSION IN EGYPTIAN VOULNTEERS

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INTRODUCTION

Optical Coherence Tomography Angiography (OCTA) is a newly developed, easy, fast, noninvasive imaging technique which employs motion contrast imaging to high-resolution volumetric blood flow information. OCTA is basically a cube scan with a three-dimensional (3D) assessment of the retinal vessels. It compares the decorrelation signal between consecutive OCT b-scans taken at the same cross-section in order to build up a map of blood flow. It eliminates the axial-bulk motion resulting from patient movement. So, the sites of motion between repeated OCT b-scans are strictly due to the movement of RBCs in retinal vasculatures.

OCTA uses a perfusion density analysis to translate each retinal vascular layer into qualitative and quantitative data. The quantitative data include the evaluation of the FAZ area, perimeter and circularity index and the retinal perfusion parameters as perfusion density and vessel density.

AIM OF THE WORK

The aim of this work was to collect normative data about the macular perfusion, vascular density and the foveal avascular zone area in superficial retinal capillary plexus in normal Egyptian volunteers using OCTA.

SUBJECTS AND METHODS

SUBJECTS:

The study was carried out on 80 eyes of normal healthy subjects of which 47.5% were males and 52.5% females. Only one eye of each individual was included in the study.

Their age ranged from 19.01 to 49.04 year with a mean of 31.45 ± 8.91 year.

METHODS:

This is a prospective study done after the approval of institutional and ethics committee (Faculty of Medicine - Alexandria University). The procedure was first explained to subjects eligible for inclusion and the consent form was signed by all.

All population included in the study were subjected to the following:

1. Full Medical and surgical history taking.
2. Complete clinical ophthalmological examination.
3. OCT angiography: Retinal images were obtained using OCTA (3mm \times 3mm and 6mm \times 6mm) by ZEISS Angioplex™ CIRRUS(6000) by a single experienced operator after pupillary dilatation.

The software acquires perfusion indices for each en-face zones. Central foveal avascular zone is automatically excluded from measurements of the perfusion indices. The foveal avascular zone (FAZ) was described in 3 terms area, perimeter and circularity.

The macular perfusion and vascular density were represented by four terms central, inner, outer and full.

RESULTS

Table: Correlation between age and the three variables vascular density, FAZ and macular perfusion (n = 80)

	Age (years)			
	R	P	Rate of change per year	% Change per years
Central vascular density	-0.284	0.011*	-0.087	-0.676
Inner vascular density	-0.163	0.148	-0.022	-0.113
Outer vascular density	-0.234	0.036*	-0.033	-0.167
Full vascular density	-0.196	0.082	-0.029	-0.151
FAZ Area	0.227	0.043*	0.003	1.415
FAZ Perimeter	0.432	<0.001*	0.020	1.255
FAZ Circularity	-0.304	0.006*	-0.003	-0.364
Central macular perfusion	-0.083	0.467	-0.055	-0.215
Inner macular perfusion	-0.259	0.021*	-0.170	-0.350
Outer macular perfusion	-0.296	0.008*	-0.218	-0.421
Full macular perfusion	-0.306	0.006*	-0.222	-0.435

r: Pearson coefficient.

*: Statistically significant at $p \leq 0.05$.

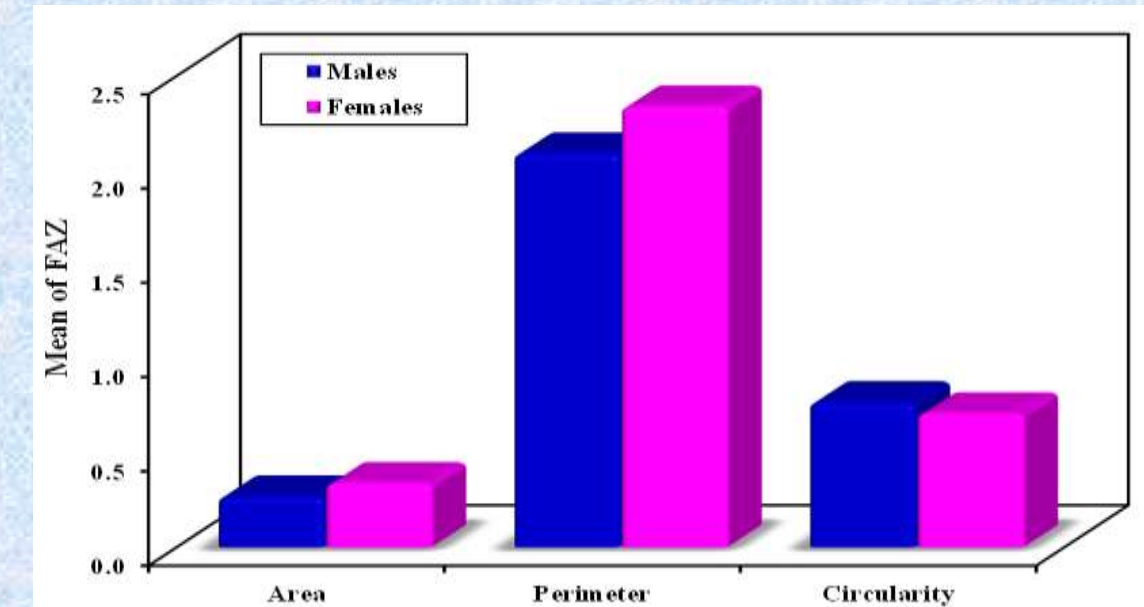


Figure: Relation between gender and FAZ (n = 80)

CONCLUSION

- There was a statistically significant increase in central and outer vascular density in males than in females. There was a statistically significant increase in outer and full macular perfusion in males than in females.
- There was a statistically significant increase in FAZ circularity in males than females. While there was a statistically significant increase the FAZ area and perimeter in females than in males.
- The age showed a statistically significant negative correlation with central vascular density, outer vascular density, inner macular perfusion, outer macular perfusion, full macular perfusion and FAZ circularity. While the age showed a statistically significant positive correlation with the FAZ area and perimeter.