

Introduction

Diabetes mellitus is associated with long-term complications of macro vascular and micro vascular including Retinopathy, neuropathy, and nephropathy. Diabetic affects the retina's neurovascular component. Two main classes of DR: **non-proliferative DR (NPDR)** in addition to **proliferative** stages: no DR, mild, moderate, severe, and proliferate DR (PDR).

Diabetic macular edema is accumulation of plasma leaked in the extracellular space in macula. It is a chronic progressive retinal disorder that results in long-lasting complete blindness. Nowadays it is classified into centrally involving and non-centrally involving. The gold standard treatment now is anti-VEGF.

The choroid is a dense vascularized structure. It supplies oxygen and nutrients to retina's outer layers (ORL) and RPE, controls posterior portion of the eye's temperature, and removes waste products from outer retina. Normal SFCT range from 191.5 ± 74.2 to $354 \pm 111 \mu$. It is divided to 5 sublayers in order from inside to outside: Bruch's membrane, (CC), Haller's and Sattler's, and suprachoroidal space. Diabetic patients without diabetic retinopathy have thicker choroid. However, a general thinning of choroid is observed on EDI-OCT with DR. Choroid was evaluated using laser Doppler flowmetry, indocyanine green angiography (ICGA), and ultrasonography in vivo, or in vitro using histological analysis. Nowadays the enhanced depth imaging optical coherent tomography (EDI-OCT) and Optical coherence tomography angiography (OCTA) are the gold standard in imaging of choroid.

Aim of the work

The study aims to assess choroidal thickness as an indicator of the diabetic macular edema response to intravitreal ranibizumab injection.

Patients and Methods

This study included 100 eyes of 53 known diabetic patients with diabetic retinopathy (either proliferative or non proliferative) and centrally involving diabetic macular edema who were eligible for intravitreal injection of Ranibizumab for treatment naïve diabetic macular edema.

Full medical and ophthalmological history and complete clinical examination.

FFA, EDI-OCT was done for all patients before start of ranibizumab and after 3monthly IVR. BCVA, CST and CCT were measured before and after treatment. Choroidal thickness was manually measured at every subfield of the ETDRS grid using the caliper tool in the Heidelberg Eye Explorer software.

Results

The mean average of choroidal thickness (CT) at 1mm sub foveal zone of the ETDRS grid before starting ranibizumab injections was $243.5 \pm 67.02 \mu$ with median of 241.0 (192.0–294.5) which decreased to mean average $229.2 \pm 60.56 \mu$ after treatment. Log MAR BCVA showed a positive correlation to CST. There was a non-specific correlation in different parts of the choroid. Some parts showed a positive correlation while other parts showed a negative correlation. Correlation between the CST and the CCT according to ETDRS was found to be positive.

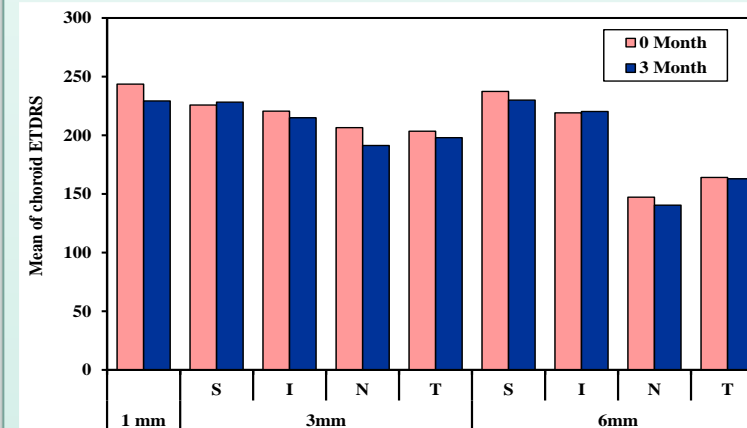


Figure: Comparison between the choroidal thickness at 0 month and 3 month follow up visits in various parts of ETDRS grid (n = 100)

	r_s	P
CST vs. BCVA (LogMAR)		
0 Month	0.441*	<0.001*
3 Month	0.543*	<0.001*

CST vs.CCT	r_s	P
1 mm	0.237*	0.018*
3 mm		
S	0.067	0.510
I	0.345*	<0.001*
N	0.110	0.276
T	0.092	0.363
6 mm		
S	0.147	0.143
I	0.268*	0.007*
N	0.125	0.213
T	0.089	0.379

Table 1: Correlation between CST with BCVA (LogMAR) (n = 100)

Table 2: Correlation between CST and CCT (n = 100)

Table 3: Correlation between BCVA (LogMAR) with CCT (n = 100)

BCVA (Log Mar) vs. CCT	0 Month		3 Month	
	r	P	R	P
1 mm	0.090	0.373	0.021	0.834
3 mm				
S	0.066	0.513	0.008	0.934
I	0.089	0.378	-0.037	0.715
N	-0.049	0.629	-0.105	0.297
T	0.057	0.572	0.030	0.770
6 mm				
S	0.002	0.988	-0.163	0.106
I	-0.048	0.633	-0.133	0.187
N	0.063	0.531	-0.352*	<0.001*
T	0.037	0.716	0.014	0.894

Conclusion

- CCT and CMT have positive correlation with each other.
- Improvement of BCVA is not related to changes in CT.
- CCT and LogMAR BCVA have nonspecific correlation when measured before and after treatment with Ranibizumab, some parts showed positive correlation while others showed negative correlation.
- Ranibizumab decreases CT significantly specially in the SF region.
- LogMAR BCVA showed positive correlation with CMT before and after IVR injections.