Summary & conclusion

Diabetes mellitus is one of the most common noncommunicable diseases, and its epidemic proportion has placed it at the forefront of public health challenges currently facing the world.

In the eastern mediterranean region, there has been a rapid increase in the incidence of diabetes mellitus, consisting mainly of type 2. It is now the fourth leading cause of death in the region. In 2003 It was estimated that the male prevalence of diabetes and IGT in Egypt is 7.5% while the female prevalence is 6.7% .

Diabetic Retinopathy is the most frequent and specific chronic microvascular complication of diabetes mellitus; it is the leading cause of new-onset blindness among people of working age. Diabetic macular edema (DME), a microvascular complication of diabetes mellitus, accounts for about three-quarters of cases of visual loss due to diabetic eye disease, yet it is still an underestimated complication of diabetes

The incidence of DME in astudy over a 10-year period was 20.1% among patients diagnosed before age of 30 years (younger onset) and 39.3% among patients diagnosed after age of 30 (older onset).

The frequency of DME increases with the duration and the severity of diabetes, where it was reported that 27% of patients develop macular edema Within 9 years of diabetes onset.

In the presence of macular edema, older onset diabetic patients have visual acuity worse than 20/40 compared to younger onset diabetic patients.

The pathogenesis of DME is not fully understood and a satisfactory therapy is currently not available. Malfunction of the blood-retinal barrier plays a central role in the disease and leads to retinal edema and secondary photoreceptor dysfunction. Diabetic vascular leakage and macular edema are caused by a distinct combination of direct paracellular transport, alterations in endothelial intercellular junctions and endothelial cell death.

Hyperglycemia is the major risk factor for development of diabetic retinopathy. It leads to high intracellular levels of glucose, formation of free radicals (oxidative stress), and protein kinase C activation. Chronic hyperglycemia also leads to formation of advanced glycation end products (AGEs), which may be the inciting event for diabetic retinopathy and maculopathy. Accumulation of AGEs in the vitreous and vitreoretinal interface is associated with neurovascular injury seen in diabetic retinopathy. Although disrupted BRB plays a pivotal role in the pathogenesis of DME, altered vitreomacular interface may contribute significantly to the progression of macular edema .

Fluorescein angiography is a standard method used to evaluate patients with DME that is sensitive for qualitative detection of fluid leakage. Once a patient is diagnosed with CSME, an angiogram is usually performed to identify the treatable leaking lesions and to evaluate ischemic areas.

FA reveal three patterns of DME, focal, diffuse and CME. Where focal macular edema has been associated with less macular thickening, better visual acuity , and less retinopathy severity.

Since OCT became commercially available in 1995, it has provided useful information on the morphologic changes associated with a variety of vitreomacular diseases, including macular edema.

OCT is potentially useful in monitoring progress over time, particularly changes in retinal thickness, size of cysts and serous retinal detachments. Several studies have however shown that CME on FA does not always correspond to cystoid changes on the OCT scans and vice versa.

There are four patterns of structural changes in DME: sponge like retinal swelling, cystoid macular edema (CME) , serous retinal detachment (SRD), and traction retinal detachment (TRD) attributable to posterior hyaloidal traction (PHT).

Optical coherence tomography seems particularly relevant to the analysis of the vitreomacular relationship. Indeed, OCT is much more accurate than biomicroscopy and FA in determining the status of the posterior hyaloid when it is only slightly detached from the macular surface and in assessing whether or not surgical intervention is required.

OCT has been shown to be a reliable method for evaluating retinal edema and is more effective in picking up subtle irregularities than clinical examination. Identifying the structural changes in patients with DME using OCT may allow more effective management of these patients. Each of the five morphologic subtypes may represent distinct entities that require specific

treatment regimens to achieve the best final result. In addition to identifying each of these patterns, OCT may be useful not only in determining which treatment should be applied, but also in following the progress of this process over time .

Pan retinal photocoagulation, vitrectomy and intravitreal corticosteroid injection are potentially valuable therapeutic modalities for diabetic macular edema The combined data from fluorescein angiography and OCT classification would be helpful for selecting the suitable therapeutic modalities for each patient.

In conclusion, OCT remains the mainstay for the decision on surgery by demonstrating the vitreofoveal traction, which is very difficult to demonstrate by any other method in diabetic maculopathy, and Fluorescein angiography is still essential for the assessment of the foveal perfusion state which cannot be demonstrated with OCT. So, after an initial FA, OCT seems to be a useful noninvasive tool in the close follow-up of the effectiveness of treatment modalities in diabetic maculopathy.