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Session 166

THE VITREO-MACULAR INTERFACE

AND THE RESPONSE TO ANTI VEGF THERAPY IN DIABETIC MACULAR OEDEMA

PURPOSE

To analyze the (VMI) in patients treated with anti-VEGF therapy for centre involved diabetic macular oedema (CIDME) and to investigate if VMI status has an effect on the treatment response.

METHOD

We performed a retrospective, observational, cohort study of patients treated with anti-VEGF therapy for center involved diabetic macular oedema. Patients were treatment naïve for anti-VEGF therapy but not for macular laser therapy. Patients were either type 1 or type 2 diabetics.

All patients treated with anti-VEGF therapy for CIDME over a three-year period (Oct 2011- Dec 2014) were identified from a retrospective chart review.

Patients with a full 12 months of completed follow-up were selected for analysis. The VMI status, central macular thickness (CMT) and visual acuity (VA) at initial injection visit and at each subsequent injection visit were recorded in the selected patients.

Patients with fundus fluorescein angiography (FFA) and SD OCT pre treatment and at each subsequent injection visit were included. Patients with a history of vitrectomy were excluded. Patients with VMA but who later developed VMD were also included

Figure 1a. SD-OCT image of vitreo-macular adhesion

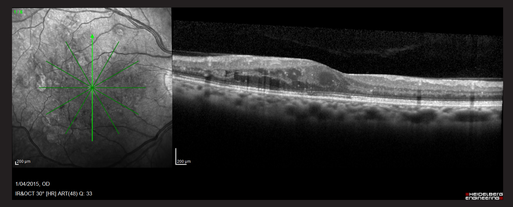
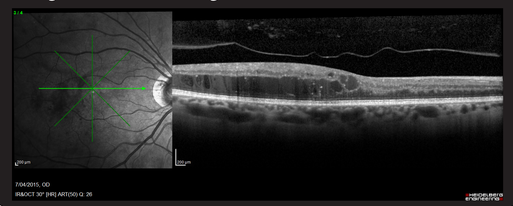


Figure 1b. SD-OCT image of vitreo-macular detachment



Center involved diabetic macular oedema was diagnosed on FFA evidence of characteristic leakage pattern involving the anatomical center of the macular. This was correlated with SD OCT and used for subsequent follow up.

Two VMI groups were identified vitreo-macular adhesion (VMA), Figure 1a, and vitreo-macular detachment (VMD), Figure 1b, on SD-OCT. VMA was defined as a non separated hyaloid reflectance line on SD OCT centered around the fovea. VMD was defined as a fully detached or focally attached (<50um) hyaloid reflectance line without any broad macular attachment on SD-OCT. During the 12-month period 5 eyes changed from the initial VMA to VMD and were included within the VMA cohort. Central macular thickness was measured on the para foveal area.

All patients were treated with Bevacizumab (1.25mg/0.05ml) intravitreal injection with adherence to publish protocols for this procedure.

To conserve degrees of freedom we used parsimonious model and excluded age and sex from model. Missing data were extrapolated with interpolation, comparison made between data set with interpolation and original data and showed no distorting of relationship for both the mean and the significance.

RESULTS

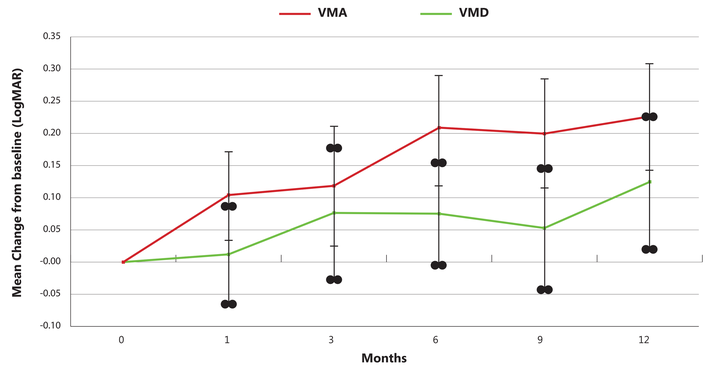
41 eyes of 33 patients treated with Bevacizumab for CIDME were analysed. Median age of patients was 63.7 years, with 15 females (36.6%), 26 males (63.4%).

The median and mean VA at presentation was 0.400 and 0.415 respectively with a standard deviation of 0.2731. For the attached group the median and mean were 0.300 and 0.399 respectively with standard deviation of 0.26. For the detached group the median and mean were 0.480 and 0.436 respectively with standard deviation of 0.29.

The overall median and mean CMT at presentation was 414 um and 428.74 um respectively with a standard deviation of 172.45.

At initial treatment 24 patients (58.5%) had VMA and 17 patients (41.5%) had VMD. Median age of VMA patient was 56.7 years and median age of VMD patient was 73.6 years.

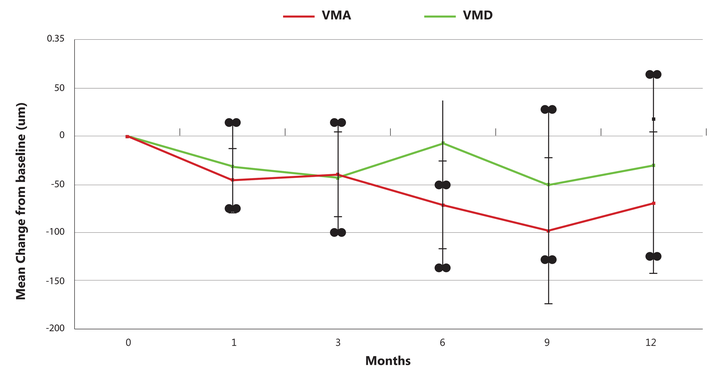
Graph 1: VA vs time in VMA and VMD patients treated with anti-VEGF for CIDME.



Graph 1 shows an improvement in VA of both VMA and VMD patients over the course of 12 months compared to baseline. The results are shown in logMAR and inverted to allow easier interpretation where an increase in score shows increase improvement of VA. The mean VA of the VMA group improved from an initial 0.399 to 0.173 at 12 months. Improvement in mean visual acuity is observed by 4 weeks after initial treatment. In the eyes with VMA, the greater efficacy of Bevacizumab becomes apparent as early as 4 weeks after the initial injection.

The mean change from baseline in the VMA group at months 1, 3, 6, 9 and 12 were 0.1042, 0.1185, 0.2089, 0.1996 and 0.2263 respectively ($p < 0.05$). In the VMD group the VA improved from an initial mean of 0.436 to 0.312 after 12 months of injection. The mean change from baseline at months 1, 3, 6, 9 and 12 were 0.0120, 0.0764, 0.0752, 0.0529 and 0.1246 respectively ($p > 0.05$, except at 12 months).

Graph 2: CMT vs time in VMA and VMD patients treated with anti-VEGF for CIDME.



After 12 months of treatment the central macular thickness decreased for both VMA and VMD, the CMT for the VMA group reduced from an initial mean thickness of 444.79 um to 375.87 um at 12 months while the CMT of the VMD group reduced from an initial 406.06 to 375.65 at 12 months. For the VMA group the mean thickness compared to baseline at months 1, 3, 6, 9 and 12 were -45.79, -39.63, -71.07, -98.06 and -68.92 respectively ($p<0.05$) except for months 3 & 12 which were 0.075 and 0.066 respectively. For the VMD group the mean thickness compared to baseline at months 1, 3, 6, 9 and 12 were -30.78, -42.18, -6.5, -50.06 and -30.41 respectively ($p > 0.05$).

For the VMA group, the Pearson correlation for thickness at 1 and 3 months in predicting VA at 3 months were -0.487 and -0.455 with $p<0.05$. Further more, the 6 months thickness has a Pearson correlation of -0.472 for the VA at 12 months, $p<0.05$, suggesting that the 6 months thickness within the VMA group is a good predictor of the VA at 12 months.

There was no statistical significance observed for the VA in relation to the number of injections which occurred over the 12 months period, $p>0.05$. For the frequency of injections related to the thickness of the VMD group, there is a statistical significance of $p<0.05$, where the Pearson correlation for months 6, 9 and 12 were -0.581, -0.62 and -0.625 respectively.

CONCLUSION

The visual acuity of patients treated with Bevacizumab for CIDME with VMA revealed a statistically significant improvement through all months. In the VMD patients there was an improvement in VA but this was not statistically significant.

For the VMA group CMT at 6 months is predictive of VA at 12 months, however this was not seen with the VMD group.

There was a reduction in central macular thickness at every month compared to baseline in VMA patients but the results were statistically significant only at months 1, 6 and 9. In patients with VMD the CMT showed improvements at all months compared to baseline however they were not statistically significant ($p>0.05$).

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