

CHAPTER VI

CONCLUSION

In the present study, using the intravital fluorescent microscopic techniques, the effects of vitamin C supplementation on diabetic induced endothelial dysfunction were studied. The followings are the conclusions of our findings.

1. The elevation of blood glucose and HbA_{1c} were demonstrated in both groups of STZ-rats and STZ-Vit C rats. However, it was found that the levels of blood glucose and HbA_{1c} were significantly decreased in STZ-Vit C at 36 weeks as compared to STZ-rats ($p < 0.001$).

2. Our result has confirmed the decrease in plasma vitamin C due to diabetic condition. And plasma vitamin C level was significantly normalized to control values after supplementation of vitamin C (1g/L added in drinking water).

3. The MDA level was significantly increased in STZ-rats compared with the age-matched control rats. For all experimental periods, the significant less of MDA levels were obtained in STZ-Vit C groups compared with STZ rats.

4. Using intravital fluorescent microscopic study, the significant increase in leukocytes adhesion to the endothelial lining of iris postcapillary venules (diameter 20-50 μm) was observed in STZ rats compared with control rats for all five monitored time points. Interestingly, these leukocytes adhesion were significant prevented by vitamin C supplementation on 24 and 36 weeks of diabetic duration.

5. The iris blood-flow perfusion were significantly decreased in diabetic rats when compared to their age-matched controls. However, the supplementation of vitamin C significantly prevented such reduction in iris blood-flow perfusion on 24 and 36 weeks of diabetic induction.

6. The results suggest that in diabetic state, there is a correlation between the increased leukocyte adhesion and the decreased iris blood-flow perfusion ($r = - 0.317$, $P < 0.034$). Besides, the correlation could be represented by the linear regression of $y = - 0.447 x + 32.80$. Especially, the supplementation of vitamin C, as which the decrease in leukocyte adhesion was observed and consequently resulted to the reduction of iris blood-flow perfusion, had confirmed the correlation between leukocyte adhesion and of iris blood-flow perfusion. Since the correlation factor of both parameters was increased to $r = - 0.517$ with $p < 0.001$; $y = - 1.862 x + 47.10$.

7. In accordance with the results of those correlation, the idea is that the prevention of adhesive-molecule expression on endothelium and leukocytes will assist able to prevent the reduction of iris blood-flow perfusion. In particular, it may be crucial therapeutic way to prevent the ischemic retina that is the initial event in diabetic retinopathy.

8. Finally, we would like to suggest that vitamin C-supplementation can be a great therapeutic agent in preventing diabetic vascular complications. Diagram showed in Figure 2., represent the hypothesis summarized for the effects of vitamin C on diabetic microvascular complications. In accordance to this benefit effects of vitamin C, therefore, it should be on recommendation for diabetic patients in order to prevent then from diabetic complications.