Chapter V
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The present study was an experimental study on the “Effect of Vitamin E Supplementation on Immune Responses of Middle and Long Distance Runners”.

For the purpose of the study initially, 60 collegiate athletes (30 male and 30 female) who had been participating in middle and long distance competitions in various championships like M G University Athletic Championships, District and State level athletic championships, etc were selected. The subjects were selected from different colleges affiliated to Mahatma Gandhi University, Kottayam, Kerala.

The subjects were initially selected on the basis of convenience depending upon the number of athletes involved in middle and long distance competitions during the last three years. Following the convenience sampling, and on the basis of the consent of the athletes, the final sample was randomly assigned to two groups; the experimental and control groups, with 30 subjects in each group.

The sample included those athletes who had been active and participating in the competitions during the last three years. The purpose of the study was explained to all the participants, and the willing consent was obtained from the athletes and the concerned authorities before enrolling them as subjects for the study. The subjects were informed that they were free to withdraw from the study at any point of time if they found the process uncomfortable.
The experimental group was required to undergo the supplementation of vitamin E (Evion 400 (mgu)) for a period of two months. The control group was also given a placebo supplementation (lactose) for the same period of experimentation. The following immune response variables were selected as appropriate for the study:

(a) Hemoglobin
(b) WBC Total
(c) Neutrophils
(d) Lymphocyte
(e) Eosinophils
(f) Monocytes
(g) RBC
(h) Platelet
(i) Serum Cortisol
(j) Immunoglobulin
   i) IgG
   ii) IgA
   iii) IgM

Pre and post test were taken to assess the immune variables; and also pre and post test was taken to assess the immune response immediately prior and after a competition.

The final post test data were obtained for only 46 athletes which included 26 male and 20 female athletes (twenty four in the experimental group (fourteen male and ten female); and twenty two (twelve male and ten female) in the control group) with
fourteen athletes not turning out for the post test and who had withdrawn from the study in between due to various reasons. For the data immediately prior to and after the competition, data were obtained from only 38 athletes (twenty in the experimental group (12 male and 8 female) and eighteen (10 male and 8 female) in the control group).

The data collection involved a pre test on the immune response variables for all the subjects, which was conducted in the month of October 2011. Blood samples of the subjects were taken for analysis of immune response variables at EI Lab, Metropolis, Vytila, Ernakulam. Later the subjects underwent the experimental treatment of Vitamin E supplementation (Evion 400, mgu) for a period of two months (experimental group), while the control group was given placebo dose (lactose) during the same period. The post test was done after the two months period of experimental treatment in the month of December 2011.

To find out the effect of experimental treatment (vitamin E supplementation), the data on the pre and post test of the experimental and control group was analysed using t –test and analysis of covariance. To find out the acute immune response following competitions for the experimental and control group, the t- test and analysis of covariance was employed. The analysis was done with SPSS (version 20). The level of significance chosen was 0.05.
5.2 Conclusions

On the basis of the findings of the study, the following conclusions were drawn:

(i) Significant increase from pre to post test was observed for hemoglobin, monocytes and immunoglobulin IgM for the experimental group following vitamin E supplementation.

(ii) Significant decrease from pre to post test was observed for eosinophils, immunoglobulin IgG and immunoglobulin IgM for the experimental group following vitamin E supplementation.

(iii) Significant increase from pre to post test was observed for monocytes and immunoglobulin IgG for the control group following placebo supplementation.

(iv) There was significant increase from pre to post test values on hemoglobin, monocytes and immunoglobulin IgM for the experimental group as compared to control group following vitamin E supplementation.

(v) There was significant decrease from pre to post test values on eosinophils, immunoglobulin IgG and immunoglobulin IgA for the experimental group as compared to control group following vitamin E supplementation.

(vi) Significant increase from pre to post test was observed for the experimental group for eosinophils, serum cortisol, immunoglobulin IgG, immunoglobulin IgA, and immunoglobulin IgM for the acute response following competition.
(vii) Significant decrease from pre to post test was observed for the experimental group for hemoglobin, wbc total, and platelets for the acute response following competition.

(viii) Significant increase from pre to post test was observed for the control group for serum cortisol, immunoglobulin IgA, and immunoglobulin IgM for the acute response following competition.

(ix) Significant decrease from pre to post test was observed for the control group for hemoglobin and red blood corpuscles for the acute response following competition.

(x) In case of acute responses following competition, results revealed that there was significant increase from pre to post test values for the experimental group as compared to control group for hemoglobin and monocytes.

(xi) In case of acute responses following competition, results revealed that there was significant decrease from pre to post test values for the experimental group as compared to control group for eosinophils, platelets, and immunoglobulin IgM.

5.3 Recommendations:

The findings and conclusions drawn, leads to the following recommendations:

(i) High intensity long duration exercise and nutrition exert separate influences on immune function; these influences appear to be stronger when exercise stress and poor nutrition act synergistically. Therefore, athletes in general need to avoid micronutrient deficiencies.
(ii) Though convincing evidence are lacking on the exact role and action of antioxidants in preventing exercise induced immune impairment, Vitamin E supplementation may be recommended for high intensity long duration exercises so as to reduce the intensity of oxidative stress by enhancing the antioxidant defence mechanism.

(iii) Studies may be replicated with multivitamin supplementation to investigate the mediating effect on immune responses among middle and long distance runners.

(iv) Further research needs to examine the role of other nutritional supplements in countering immune dysfunction in heavily exercising athletes.