Effect of muscular exercise on volumes and immune response

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The aim of our study is to detect the inter-sport difference of heart volumes and its impaction on immune response to muscular exercise by quantitative measurmemts of C-reactive protein and IgA,IgG.The practical part of the study was done at Sport -Medicine Specialized Centre. Thirty eight contact sport athletes, and seventeen non athletic male volunteered persons were recruited in the study. The athletic participants were chosen during the season of competitions, and were classified into two groups :Group (A) contains twenty four football players, aged20-30ys, were chosen from the first team of Arab Contractors club.Group (B) contains fourteen players of Boxing (4), Wrestling (4), Judo (2), and Taykondo(4).They were chosen from the school of Talented. They aged 14-15ys. The controls were also classified, according to their ages, into 2 groups , each one matches with an athletic group in age.Clinical examination, CBC, biochemistry, ECG, and echocardiography were done for all participants. They perform Bruce protocol on a motor-driven treadmill. Five ml of blood were taken before and immediately after performing exercise to measure serum IgA& IgG by using Radial Immunodiffusion & CRP by using IVD-Latex Reagent. Statistical analysis of the data performed by using the 15th version of SPSS.ECGs of athletes showed sinus bradycardia in 83% (n=20)of group(A), 14.2% (n=2)of group (B), while the mean resting heart rate of group A was 55.33± 7.44, it was 65.14±8.77 for group B. A highly significant difference was observed between group A and control group A, and between group B and control group B as regard pre-exercise heart rate. The criteria of mild LVH appeared in 16.7% (n=4) of group (A) and 14.28% (n=2) of group (B).Echocarrdiography revealed that 37.5% (n=9) of group (A) had LVEDD above 55mm and five football players, but the upper limit was 57mm. A highly significant difference was observed between group A and control group A as regards mean LVEDD.20.8% (n=5) of group A had upper normal range of IVS & PWT. The mean IVS & PWT of group A was 9.91±0.7, while the mean IVS of group B was 9±0.13.Two football players showed mild enlargement of LA. The systolic and iastolic functions for all participants are normal.IgA decreased after exercise among athletes, but this decrease had no statistical significance. Also IgG decreased after exercise and this decrease was statistically significant for group (B).on the other hand IgA& IgG increased after exercise among controls however, -this increase was statistically insignificant.The mean pre- & post-exercise IgA &post exercise IgG of athletic group B were lowered than those of control group B , those lowering were statistically highly significant. The mean post-exercise IgA was 113 ±

7.382, 224.34±68 for groupA&control group(A) repectively, a highly significant difference was observed between Athletic group A & Control group A as regards post-exercise IgA.The effect of exercise on C-reactive protein did not appear as it was negative (below 6mg /dl) for all participants before and after exercise.ConclusionAll the ECG and morphological changes can be explained as a physiological adaptation of the athlete’s heart to regular exercise, and we can consider such changes as criteria of benign athletic heart syndrome.Intense exercise appeared to have negative impaction on the immune response of well trained athletes, represented by lowered serum IgG &IgA After exercise among athletic participants.Although,many studies reported that physical exercise can lower the serum CRP, this effect did not appear in our study as the baseline of CRP was low.General RecommendationsECG and echocardiography must be done for athletes as a routine investigations to detect any cardiovascular abnormality and to differentiate the physiological enlargement of the athlete ’s heart heart from the pathological cardiac conditions (e.g. hypertrophic cardiomyopathy) to avoid the tragic events of sudden cardiac death in the field, either during training or competitions.Rest, hydration, and good nutrition are recommended for athletes after vigorous exercise to allow the body to recover, as it appears to be a window of opportunity for infection during recovery from high intensity exercise.Avoid stressors to the immune system of athletes (e.g. rapid weight loss, severe mental stress, lack of sleep and malnutrition) when they go through repeated bouts of heavy exertion, aiming to decrease their risk for infection.Special Recommendations- Measurement of CRP may be helpful among athletes particularly, those with cardiomegally. It seems to be a simple non-invasive method can help to differentiate athelitic heart syndrome when, CRP is suspected to be low , due to the effect of regular muscular exercise from pathological cardiomegally, as CRP maybe high with cardiovascular diseases . .- A comparative study between sprint and endurance trained athletes subjected to the same exercise regimen to assay immunoglobulins A&G inboth.- A correlation between serum cortisol concentration and immunoglobulins A&G before and after exercise.- A common perception among elite endurance athletes and coaches is that overtraining lowers resistance to URTIs which interfere with the ability of the athlete to compete and train. Hence, it is so important for the coaches, to avoid increase the intensity of training to the extent of overtraining.- A correlation between glutamine and immunoglobulins A& G before and after exercise must be done.- Assay of T cell function, phagocytic activities in athletes before and after exercise especially those with repeated upper respiratory tract infections, must be done.