MEIR MEDICAL CENTER
Affiliated with the Sackler Faculty of Medicine
Tel Aviv University

The combined frequencies of the IL-6 G-174C and IGFBP3 A-202C polymorphisms among swimmers and runners
Sigal Ben-Zaken, Yoav Meckel, Dan Nemet, Eias Kassem, Alon Eliakim

CLALIT 100 YEARS

INTRODUCTION

Previous studies have demonstrated that compared to runners, swimmers carry a higher prevalence of the IL-6 -174C polymorphism and lower single nucleotide polymorphism frequencies of the IGF system.

OBJECTIVES

The aim of the present study was to assess the combined frequency of the IL-6 -174G/C and IGFBP3 -202A/C polymorphisms among track and field athletes and swimmers.

METHOD

Track and field athletes were divided into long-distance runners (major event 5000 m-marathon, n = 63) and power athletes (major event 100-200 m sprints and long jump, n = 67). Swimmers were divided into long-distance swimmers (major event: 400-1500 m, n = 50), and short-distance swimmers (major event: 50-100 m, n = 43). All participants had achieved results that ranked them among the top all-time Israeli athletes in their event, and competed at national and/or international level on a regular basis.

RESULTS

Carrying both IL-6C and IGFBP3C mutations was significantly greater among long-distance swimmers (LDS - 44%) compared to long distance runners (LDR - 21%, p < .01), and among short distance swimmers (SDS - 49%) compared to sprinters and jumpers (S/J - 28%, p < .05). Among runners, the prevalence of those not carrying either of the two mutations was significantly higher among LDR (25%) compared to S/J (10%, p < .03).

Group	n	M/F	Age (Mean ± SD, range)	Top/National level	Main event
Controls	64	46/18	26.3 + 6.7, 20–49		
Runners					
S/J	67	46/21	31.2 + 14.2, 17–55	25/42	100-200 m, jumps
LDR	63	51/12	32.4 ± 9.5, 17–55	22/41	5000 m-marathon
Swimmers					
SDS	43	29/14	23.2 + 7.4, 16–49	10/33	50-100 m
LDS	50	32/18	23.7 + 8.7, 14–48	20/30	400-1500 m
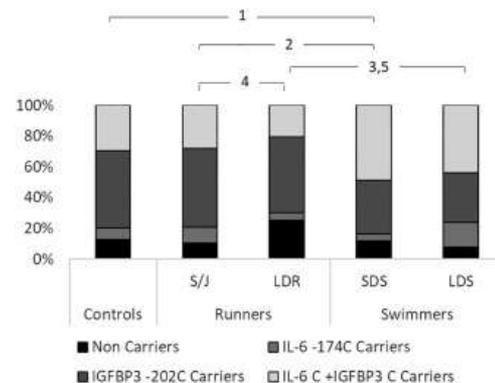
The combined frequencies of *IL-6* -174C and IGFBP3 -202C allele carriers.
[1] $\chi2 = 4.03$, df = 1, p ($\chi2 > 3.25$) = 0.044; Carriers of both mutations SDS vs. Control.
[2] $\chi2 = 4.75$, df = 1, p ($\chi2 > 3.25$) = 0.029; Carriers of both mutations SDS vs. S/J.
[3] $\chi2 = 7.12$, df = 1, p ($\chi2 > 3.25$) = 0.008; Carriers of both mutations LDS vs. LDR.
[4] $\chi2 = 4.98$, df = 1, p ($\chi2 > 3.25$) = 0.025; non carriers LDR vs. S/J.
[5] $\chi2 = 5.79$, df = 1, p ($\chi2 > 3.25$) = 0.016; non carriers LDR vs. LDS.

CONCLUSIONS

The prevalence of carrying both IL-6C and IGFBP3C mutations was significantly higher among the swimmers compared to runners. It is possible that carrying the IGFBP3C polymorphism is required to compensate for the potential genetically non-beneficial effects of a higher IL-6C genotype and an attenuated IGF system among the swimmers.