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Influence of Physical Qualities on Game Performance, Acute Physiological Responses and Post-Game Recovery in Ice Hockey

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## INTRODUCTION:

Understanding the effects of physical qualities on game performance, loading and post-game recovery are needed in professional team sports in order to optimize physical training. Despite the growing number of scientific research in ice hockey during the past couple of decades, there is still lack of knowledge in this area. Therefore, the purpose of the present study was to examine the influence of physical qualities on game performance, acute physiological responses and post-game recovery in ice hockey. **METHODS:** 

Thirty-eight male professional ice hockey players (age 26.2 ± 4.6 years; height 181.9 ± 5.9 cm; body mass 85.6 ± 6.5 kg) from two different teams participated in the study. Aerobic (maximal oxygen uptake [VO2max]) and anaerobic (Wingate 30 s peak power [PP]) bicycle ergometer tests were executed during the pre-season five weeks prior to an official ice hockey game played against the teams at the beginning of the regular season of the Finnish Elite League. Neuromuscular performance (countermovement jump [CMJ]), hormonal responses (testosterone [T]; cortisol [C]) and immunological markers (interleukin-10 [IL-10]) were assessed before (pre-9h; pre-2.5h) and after (post-0h; post-12h) the game. During the game, skating volume and intensity were recorded using a Local Positioning System. Players were divided into high- and low-groups based on their level of physical gualities.

**RESULTS:** 

VO2max correlated with the skating volume, amount of high intensity skating and repeated high intensity sprints during the game (r=0.33-0.44; p<0.05). CMJ height increased from pre-9h to post-0h in the lower PP group (5.7%; p<0.05), whereas the opposite was found in players with higher PP (-2.2%; p<0.05) despite no differences in game load were observed between the groups. The higher PP group maintained CMJ height from post-0h to post-12h, while there appeared a significant reduction in the lower PP group (0.5% vs. -4.4%; p<0.05). Additionally, a greater reduction in T:C-ratio and T were noticed immediately after the game compared to the pre-values, and more pronounced recovery 12 hours after the game in players with higher VO2max and PP. Furthermore, IL-10 increased more in the higher VO2max group from pre-9h to post-0h (128% vs. 43%; p<0.05) and recovered to a higher extent from post-0h to post-12h (38% vs. 13%; p<0.05). CONCLUSION:

Aerobic endurance capabilities and ability to produce high amount of high intensity skating during official ice hockey game appear to be related. In addition, players with well-developed physical qualities, particularly higher aerobic power, seem to generate higher external, hormonal and immunological load during the game but also recover more rapidly after the game. Given the level of physical qualities related to differences in loading and recovery, the individual physical profile should be taken into account when designing physical training for ice hockey players in relation to their playing schedule.

Topic: **Training and Testing** 

Presentation

Poster

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