On-Ice Performance Characteristics According to Position in Elite, College-Level, Male Hockey Players

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Introduction

Previous research has identified differences between ice hockey defenseman and forwards using a combination of on-ice skating ability measures and off-ice general fitness measures. The current study is the first to assess on-ice skating ability using accelerometers for the calculation of player load; a metric used to describe instantaneous, multi-directional accelerations.

Purpose

To identify differences in Playerload™ (PL), Total Strides (TS) and Average Force per Stride (FPS) between defenseman and forwards during an on-ice game like repeated sprint test.

Hypothesis

Hypothesis 1: Defenseman will have lower player loads than forwards
Hypothesis 2: Defenseman will take fewer total strides than forwards
Hypothesis 3: Defenseman will have lower average force per stride.

Methods

Twenty-Two NCAA Division I hockey players (8 defensemen, 14 forwards) were outfitted with Catapult s5 monitors (accelerometers). They performed an on-ice skating test consisting of 8 maximal effort bouts, performed in full gear, lasting approximately 22.7 seconds with 90 seconds of passive recovery in between. PL was calculated as the quotient of the square root of the sum of the squared instantaneous rates of change in all acceleration planes over 100. Playerload™ Decrement (PLD) was calculated as 100 times the quotient of the lowest PL value over the greatest PL value minus 100. TS and FPS were calculated using Catapult’s "Hockey Strides" algorithm and individual bodyweight. These metrics incorporate data from a tri-axial gyroscope and tri-axial accelerometer.

Results

PL was found to be significantly greater in forwards, compared to defenseman, during all eight sprint repetitions. Forwards were also found to take significantly more TS towards the end of the repeat sprint test (the seventh (p=.05) and eighth (p=.004) repetitions). Defensemen were found to have a trend towards a decrease in FPS (p=.067) from the first to the last sprint repetition, whereas forwards did not. There were no significant between group differences in FPS.

Conclusions

There are significant differences between forwards and defensemen in terms of PL and TS during a maximal effort repeated sprint test, supporting the theory that, at the elite level, there are inherent differences between defensemen and forwards.