

GPS ANALYSIS OF A TEAM COMPETING IN A UNDER 18 HOCKEY TOURNAMENT



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Introduction

Hockey is an invasive team sport, which incorporates offensive and defensive skills during periods of high- and low-intensity activity. Games are often played in tournament format, requiring teams to play up to three matches over a four-day period which may lead to the accumulation of fatigue (2). Research into the running demands of hockey has increased in recent years due to the advances in global positioning systems (GPS) and motion analysis software (4) but has primarily focussed on the elite and international level with limited investigation of the developing level (3). Therefore, the purpose of this investigation was to investigate the running demands of development-level athletes during tournament match-play.

Methods

Time-motion analysis was conducted on participants ($n = 10$) via GPS monitors (VX350b Log, Visuallex Sport International Ltd., Lower Hutt, New Zealand) during an Under 18 national hockey tournament consisting of 6 matches over a 7 day period.

- To limit error, each participant wore the same unit for all matches and units were turned on 15 minutes prior to the pre-match warm up to allow for the acquisition of a stable satellite signal (5).
- Post-match the data was trimmed to time-on-pitch in order to determine the running, distance-related parameters of Total distance, High-intensity Activity (HIA; ≥ 15 km.h⁻¹) and Low-intensity Activity (LIA; ≤ 14.9 km.h⁻¹).
- All variables were log-transformed to reduce bias due to non-uniformity of error.
- Data was analysed using effect size (ES) with 90% confidence intervals and percent difference to determine the magnitude of effect using a custom spreadsheet (1).

Findings

- Mean TD covered, independent of positional group, per match was 5852 ± 1005 m.
- Midfielders covered significantly ($p \leq 0.05$) greater TD than the other positional groups and HIA distance than defenders.
- Strikers covered significantly ($p \leq 0.05$) greater HIA distance and lower LIA distance than the other positional groups.
- Very large ES differences and percentage differences (%Diff) were identified between strikers and midfielders for TD and LIA, strikers and defenders for LIA and HIA, and midfielders and defenders for LIA.

Table 1: Quantitative and qualitative running demands comparisons between playing positions

	%Diff., ± 90% CL	ES	Qual.
Strikers vs Midfield			
Total Distance	-24.3, ± 6.0	-2.69	Very large
Total Low-Intensity Speed	-34.3, ± 7.7	-3.15	Very large
Total Hi-Intensity Speed	25.8, ± 15.0	0.87	Moderate
Strikers vs Defenders			
Total Distance	-8.4, ± 9.2	-0.64	Small
Total Low-Intensity Speed	-27.2, ± 9.6	-2.21	Very large
Total Hi-Intensity Speed	147, ± 17.1	3.65	Very large
Defenders vs Midfield			
Total Distance	-17.4, ± 9.3	-1.27	Large
Total Low-Intensity Speed	-9.8, ± 10.0	-2.09	Very large
Total Hi-Intensity Speed	-49.1, ± 19.9	-0.62	Small

%Diff, percentage difference; ES, effect size; Qual., qualitative outcome

Running Demands

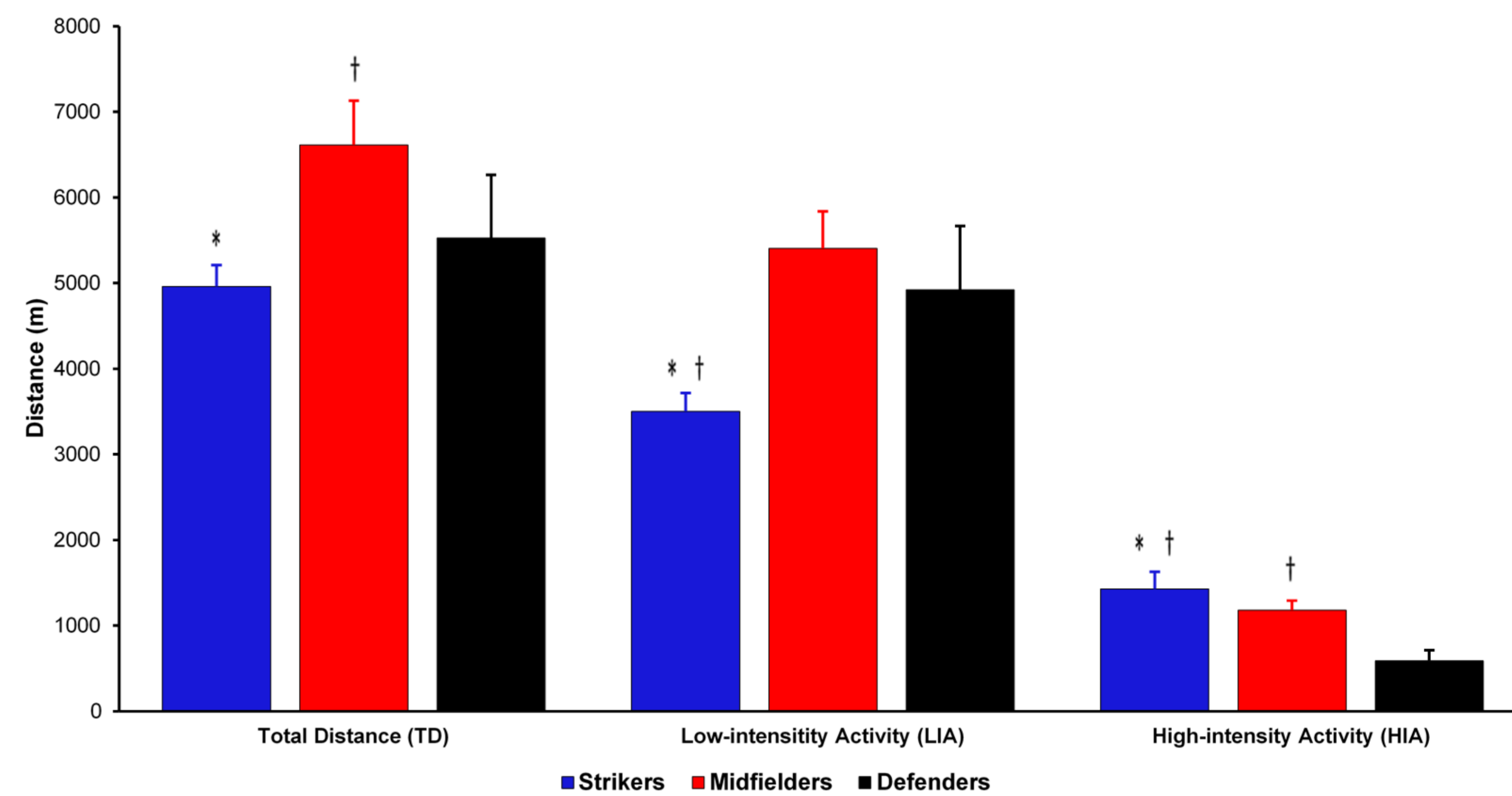


Figure 1: Comparison of running demands between hockey positional groups.
Note: * Significantly different ($p \leq 0.05$) to Midfielders
† Significantly different ($p \leq 0.05$) to Defenders

Practical Implications

“The running demands of male regional under 18 field hockey players is position specific, therefore, training schedules, substitutions and intra-match recovery should be tailored by position, taking into account the requirements of individual players.”

Future Research

- Combined video and GPS investigation into the effects of technical and tactical aspects on player running demands.
- Investigation into the influence of multiple matches in a short time-span on individual or position-specific running demands.
- Investigation into the different running demands between quarters of match-play.



References

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