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Horse warm-up regimes at two different competitive levels of show jumping: a pilot study

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Abstract
Warm-up prior to equestrian competition is considered an essential element of preparation. Little work has been previously published regarding warm-up practices within equine competition in relation to either reducing risk of injury and/or improved performance. This pilot study undertook a comparative investigation into the differences in warm-up practices at two distinctly different levels of show jumping competition. The study indicates that significant differences ($P < 0.001$) are apparent between the total time spent warming up between the levels of competition. Additionally, differences between various specific elements of warm-up were observed between the two levels.

Keywords: warm-up; show jumping; duration

Introduction

Warm-up prior to equestrian competition is considered an essential element of preparation. Both risk of injury and improved performance have been described by various authors[1]. The warm-up refers to a sequence of exercises performed prior to a performance or workout session and is a general recommendation in exercise and training programmes[2]. The importance of the warm-up is widely accepted among human athletes and equine trainers as a mandatory tool for limiting injury and optimising performance[1,3]. However, little research has been conducted into the warm-up of the equine athlete and what investigation has been conducted has focused largely on the race and event horse[4]. Currently, there is limited conformity and comprehension of optimal warm-up regimes for specific sport horse disciplines. The warm-up routine is dependent on the physiological demands of the discipline for which the athlete (human or equine) trains and will vary in duration, intensity and specificity. Following empirical observations of athletes prior to competition, Hawley and Burke[5] highlight two major trends:

1. The more intense the subsequent competition, the more extensive and prolonged the warm-up.
2. The greater the ability of the athlete, the longer they take to warm-up.

This is supported by Murray *et al.*[1], who concluded that the total warm-up duration of dressage horses increased with increased complexity of the following competition.

Despite the acceptance of the necessity of the warm-up and the vast information available regarding adaptations to exercise and training, much work needs to be compiled to provide a greater knowledge of the potential use, benefit and ultimate result of warm-up designs. The warm-up is a potential ergogenic aid to performance and its usefulness must not be underestimated in sports where the margin of victory is very small, such as show jumping[3]. This pilot study investigated the differences in warm-up activity between two levels of affiliated show jumping competition; the lowest level of affiliated competition and an intermediate level of affiliated competition.

Materials and method

Warm-up data were collated from an affiliated British Show Jumping Association Show. Competitors

Table 1 Summary of time spent (seconds) engaged in specific activities and fences jumped during competition warm-up

Activity	Level	Mean	S.E.M	Min	Max
Total warm-up time	B.Novice	901.6	32.772	460	1678
	Foxhunter	1067.1	35.582	637	1471
Time spent standing	B.Novice	124.9	16.738	0	436
	Foxhunter	128.2	20.564	0	546
Time spent walking	B.Novice	147.6	10.844	25	350
	Foxhunter	227.2	20.439	56	533
Time spent trotting	B.Novice	310.3	15.470	44	512
	Foxhunter	330.9	17.620	56	522
Time spent cantering	B.Novice	322.4	26.928	87	989
	Foxhunter	380.8	27.477	27	806
Total practice fences jumped	B.Novice	9.6	0.294	4	15
	Foxhunter	13.1	0.428	6	17
Total practice fences jumped successfully	B.Novice	8.5	0.316	2	14
	Foxhunter	11.8	0.327	6	15

performing at British Novice (lowest) level ($n = 49$) and Foxhunter (intermediate) level ($n = 38$) were observed warming up within a specific competition run at an individual venue on the same day. Data were recorded via digital stop watches. Intra-observer repeatability was assessed using the method described by Murray *et al.*[1]. Total coefficients of variation (CV) between observers for total timings were all recorded at a CV $< 4\%$, a level considered acceptable for this trial. Total time observed for whole warm-up, total time spent standing, walking, trotting and cantering were all recorded. Additionally, total number of practice fences jumped and total number of practice fences jumped successfully were observed. Normality of data was achieved using a logarithmic transformation. Descriptive statistics and measure of dispersion were returned for each dependent variable group. Comparative mean score analysis was undertaken for the dependent variable groups using the Student's t test. Test for homogeneity of variance was undertaken via Levene's test.

Results

Variations in total warm-up time and specific elements of warm-up were reported (Table 1) between the two observed levels. Significant effects were described for total warm-up time ($t = -3.492$, df $= 85$, $P < 0.001$) and total time spent walking ($t = -3.517$, df $= 85$, $P < 0.001$). Additionally, differences were observed in relation to total practice jumping efforts ($t = -6.485$, df $= 85, P < 0.001$) and total successful jumping efforts ($t = -6.219$, df $= 85, P < 0.001$). Equality of variances was reported for all groups.

Conclusions

These preliminary findings indicate that the differences in warm-up regimes are apparent between the two studied levels. The observations showed that those competing at Foxhunter level (higher) had a total warm-up that lasted on average 2 min and 47 s longer than those competing at the lower British Novice level. The Foxhunter competitors spent on average 1 min and 20 s longer walking and jumped 3.5 more fences in practice (3.3 more successfully) than those competing at British Novice level. No significant effects were observed for time standing or trotting, as these times were broadly similar between the two groups. The Foxhunter group, however, spent 2 min and 46 s more cantering although this was not reported as significant. The findings of this pilot study broadly agree with the premise that the higher the level of competition the longer the warm-up time taken[1,3].

Differences in warm-up regimes need to be considered in light of the expectation and rigours of performances at the different levels. Further evaluation of how warm-up routine differences relate to actual ranking in competition needs investigation. Consideration of whether optimum warm-up time exists is also worth reflection. Such information may assist and improve rider preparation for competition. There are potential consequential benefits for horse welfare, which nevertheless require further examination.

References

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