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Assessing the effect of cardiac murmurs on performance

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Cardiac murmurs in equine athletes 1



- It has been known for centuries that heart murmurs are very common in horses but it has been unclear whether they should be a source of concern.
 - When a heart murmur is detected at a sale, or in a horse that has performed poorly, considerable uncertainty arises as there was limited information on how heart murmurs affected race performance.
 - Valvular regurgitation, or leaking of a heart valve, is an important cause of heart murmurs but we did not know exactly how prevalent it was.
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Cardiac murmurs in equine athletes 2



- Echocardiography is an important tool which allows the structure of the heart to be assessed, and using colour-flow Doppler technology, blood flow through leaking heart valves can be detected and semi-quantified in horses with murmurs.
 - This study was undertaken in order to provide essential information on how many racehorses have murmurs, what causes them and how they affect racing performance.
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Study design: Cardiac data



- Cardiac auscultation and echocardiography of 526 race-fit flat and National hunt horses on 777 occasions
- 2 parallel studies to determine the association of cardiac murmurs with performance in both groups
- Performance data acquired from a commercially available database (Timeform) compiled at the end of each season for each horse



Prevalence of audible murmurs, detected with a stethoscope, in Thoroughbred racehorses



Murmur Type	2 year olds	Steeple chasers
Mitral valve regurgitation	7%	23%
Tricuspid valve regurgitation	20%	44%
Aortic valve regurgitation	1%	7%

N = 99 2 year olds, N = 230 NH steeplechasers; All horses at race fitness, 1st observation only

Prevalence of regurgitation prevalence by colour flow Doppler examination



Regurgitation Site	2 year olds	Steeple chasers
Mitral valve regurgitation	29%	52%
Tricuspid valve regurgitation	75%	89%
Aortic valve regurgitation	38%	65%

N = 99 2 year olds, N = 230 NH steeplechasers; All horses at race fitness, 1st observation only

Prevalence of “significant” valve regurgitation in the NH population



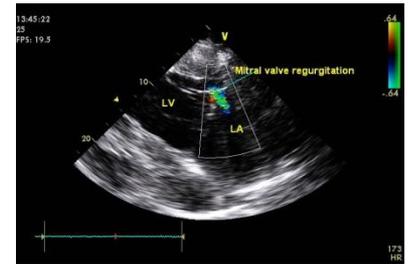
Regurgitation	Auscultation Grade > 3/6	Colour Flow Mapping Grade > 6/9
Mitral valve regurgitation	3%	5%
Tricuspid valve regurgitation	16 %	13%
Aortic valve regurgitation	2%	5%

N = 395 Data from NH horses at full race fitness only 1st observation only

Valve regurgitation (leaking) in racing Thoroughbreds



- Prevalence and severity of murmurs and regurgitation increased through different race-types ($p < 0.02$)
- Lowest in yearlings and stables and highest in steeplechasers – so the older the horse or the longer it has been trained, the more likely it is to have a murmur
- No gender effects in flat group



Summary Results: Tricuspid valve murmurs (TR)



- The grade of TR increased with **age** ($p=0.02$) and **training**
- The largest and most significant change in murmur grade occurred between **pre-training** and **race fitness**
 - average increase in grade 0.5 out of 6 ($p=0.0007$)
- The **prevalence** of TR murmurs also increased significantly between the stages of training ($p<0.05$)
 - 10% before training
 - 27% at race fitness



So these data are all very well, but what about effects of regurgitation on performance??



What does low grade valve regurgitation mean to race performance?



- Nothing...
- The horses with murmurs and leaking heart valves had similar performance outcomes to those without
- Several different ways of looking at the data came to the same conclusion.



Find out more about heart murmurs in racehorses



- Young, LE, Rogers, K & Wood, JLN.
Heart murmurs and valvular regurgitation in thoroughbred racehorses: epidemiology and associations with athletic performance

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