Commentary: Mad New Zealanders, tape, and grease: assessing protective equipment for rugby union players

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In the eyes of some, especially North Americans, what little they know of rugby union football, borders on playing field madness. Unlike armour-clad American football behemoths, rugby union players smash into one another with little or no protection against injury. Unfortunately, whatever protective equipment (PE) these players do use is not properly evaluated, and this is equally true for most sports.

The paper by Marshall et al. in this issue\(^1\) is the work of a highly qualified, international team. The findings provide modest support for some protective measures and relegate others to the status of talisman. They also reveal, consistent with my image of these madmen (and women?), that mouthguards are the only item used for more than half of the player-weeks (58%). But perhaps these rugby unionists are better scientists than we are, reasoning that without better evidence of effectiveness, why bother?

For some, the struggle to prevent injuries has become a public health crusade. For others, including a few hard-core epidemiologists and card-carrying public health officers, injury prevention remains a marginal issue, surrounded by indifference. The disinterest of epidemiologist researchers is inexplicable; that of those in public health workers may arise from the belief that there are few interventions that warrant widespread application. This is a misconception, however, because numerous injury prevention strategies e.g. promoting bicycle helmet use, are known to be effective.\(^5\) Furthermore, many studies specifically address rugby union injuries. These range from considerations of helmet design\(^3\) and its effectiveness,\(^4\) use of mouthguard,\(^5\) to a global preventive program.\(^6\)

Although for those committed to providing greater protection from injury of any kind there will always be a need for more evaluation studies, there are already many paths to follow. The most popular countermeasure involves education of some sort; either public education or physician counselling.\(^7\) Neither approach has worked terribly well, and although education remains popular among some physician groups and among policy makers looking for cheap solutions to complex problems, it still is a chimera. The second group of intervention strategies involves environmental measures such as road design, playground surfacing, and even some aspects of home construction.\(^8\) The third main thrust involves engineering or technology,\(^9\) and it is here that PE is found alongside more familiar examples, such as air bags or smoke detectors. By and large, evidence for the efficacy of such measures is convincing; their effectiveness at the population level is another matter. Thus, what is needed are more well-conceived, well-executed evaluation studies involving the largest possible groups in real-life settings.

The Marshall paper offers an excellent example of how this goal can be reached even with a less-than-optimal design. Ideally, evaluation studies should be randomized controlled trials (RCT), but there are many explanations why this powerful design, so important if the results are intended to influence policy or practice, may not be feasible.

In this instance the investigators probably chose not to attempt a RCT for several reasons. They may have assumed their ethics review board (ERB) would rebel, believing it unacceptable to deprive controls of the self-evident benefits of protective equipment. Or, they may have reasoned that even if the ERB were enlightened, few players would agree to forego all their favorite talismans . . . grease, tape, or whatever. In particular, it is hard to imagine denying ‘controls’ some of the better-studied measures e.g. mouthguards and padded-headgear. The design question is also complicated by the need to investigate several different sorts of equipment, each of which could result in a different outcome.

In light of these realities, Marshall et al. chose to conduct a cohort study of 304 players over one season. Regrettably, they were forced to nuance their conclusions because the sample lacked power. Thus, although many point estimates suggest protective effects, the confidence intervals are wide and all include unity. The problem of insufficient power plagues many—perhaps most—evaluation studies. The only solution may be the equally challenging multi-centre endeavour.

In spite of the frustration of the somewhat inconclusive results, there are many lessons to be learned from this study. For example, the appeal for funding was enhanced by two wise choices. The first was to apply to a body that has a strong reason to support this sort of work, the Accident Compensation Corporation of New Zealand (ACC). The Corporation provides compensation to all injury victims regardless of fault and so avoids costly litigation. Nonetheless, it saves more money when injuries are reduced, and this undoubtedly accounts for ACC’s interest in this project. The second choice was to package this study—the effectiveness of PE—alongside several other components. Thus what might appear to have been an expensive study (400 000 NZ dollars in 1998) is much less so when all the elements are considered.

Finally, the study team included not only researchers with solid reputations, it also included a guru of sports injury prevention with strong ties to rugby union, and at least one of

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the authors was a former player who appears not to have been concussed too often.

As one of the original reviewers, I had few minor concerns about the science. I facetiously suggested that it was unfortunate that the paper had not been sent to the ‘right’ journal—the one I edit! I did so because I regard this study as a major contribution to injury prevention and believe the methods used and some of the conclusions may well extend to many other sports involving protective equipment. Sadly, sports and recreational injuries are of increasing importance. As Conn, Annest, and Gilchrist concluded, ‘As physical activity continues to be promoted as part of a healthy lifestyle, sports-related injuries are becoming an important public health concern for both children and adults. Prevention efforts aimed at reducing (these) injuries through targeting high risk activities, places of occurrence, activity, risk behaviors, and use of protective devices need to . . . consider physically active adults.’

References