Clinical and magnetic resonance imaging features of cricket bowler’s side strain

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METHODS

Part of the Australian Cricket Board (ACB) injury prevention and management programme is a continuing survey of the injuries sustained by state and national level players throughout Australia. The survey noted that injury to the lateral trunk is a common and serious injury in first class cricket bowlers. For this study, clinical and magnetic resonance imaging (MRI) data were collected by the medical and physiotherapy staff involved in first class cricket in Australia on a standardised form, to gain an insight into the clinical pattern and anatomical details of this injury. Ten cases in pace bowlers, for which both the clinical details and the MRI findings were available, were collected over two seasons. The data collected included: when in the action the injury occurred, on which side of the body the injury occurred (bowling or non-bowling arm side), whether the bowler was left or right handed, whether the injury occurred when in the early phase, or the mid phase of this action. The pain in all cases occurred in roughly the mid-axillary line over one or more of the lowest four ribs. The patients seen by us personally were asked to illustrate the area of maximum pain, and this was found to correlate well with the area of maximum tenderness. Of the specific tests devised, it was found that all bowlers had noteworthy pain when asked to perform a resisted action of side flexing to the painful side, from a starting position either side flexed away from the painful side or from neutral. All injuries required some treatment, primarily physiotherapy aimed at pain relief, recovery of mobility, and recovery of strength. Corticosteroid injection (CSI) was used at different intervals after the injury, and again no consistent protocol was followed. Reduced load meant match bowling at some stage of rehabilitation but at a reduced pace.

RESULTS

Table 1 summarises the relevant results of the data collection. The most notable features are the consistency of the injury occurring on the non-bowling arm side, the positive side flexion test, and the high rate of a previous similar injury.

In table 1, the term full recovery was defined as returning to the same bowling level as before the injury. Physiotherapy treatment (Physio) varied from electrotherapy to massage and a strength programme; no consistent pattern of treatment was followed. Corticosteroid injection (CSI) was used at different intervals after the injury, and again no consistent protocol was followed. Reduced load meant match bowling at some stage of rehabilitation but at a reduced pace.

DISCUSSION

From the data collected, it would appear that the “bowler’s side strain” has a number of variants. In all the pace bowlers studied, the injury occurred on the non-bowling arm side when the bowler’s non-bowling arm was being pulled down from a position of maximum elevation with some lateral trunk flexion during the final delivery action. It was not possible to determine whether the injury occurred at the start, the early phase, or the mid phase of this action. The pain in all cases occurred in roughly the mid-axillary line over one or more of the lowest four ribs. The patients seen by us personally were asked to illustrate the area of maximum pain, and this was found to correlate well with the area of maximum tenderness. Of the specific tests devised, it was found that all bowlers had noteworthy pain when asked to perform a resisted action of side flexing to the painful side, from a starting position either side flexed away from the painful side or from neutral. All injuries required some treatment, primarily physiotherapy aimed at pain relief, recovery of mobility, and recovery of strength. Corticosteroid injection was performed later in the treatment plan of three cases, but owing to a lack of understanding of the natural history of the condition and no consistent protocol for such injections, no conclusion could be drawn about the value of this intervention. The value of corticosteroid injections is similarly uncertain in other muscular injuries, such as hamstring tears, but may have some role. Whereas four bowlers were able to continue bowling (at least temporarily), six stopped bowling at the time of injury. The average time to returning to bowling competitively was 29.7 days, but individually this varied from one to 70 days. No definite correlation between the MRI appearance and the time to recovery could be drawn.

Six of the bowlers had previously suffered at least one similar injury. Anecdotally this injury had been described as a “rite of passage”, which never recurred; however, these data show that recurrence is common.

These data have been used to reach a clinical description thought to best represent this particular injury group. The MRI findings are also described.

A number of epidemiological1–3 and review papers4 have been published on cricketing injuries. In these papers injuries to the lateral trunk muscles are noted as occurring in bowlers. These injuries have been identified as having a significant incidence and prevalence.1 There is no clinical description of this injury in the literature, nor has the anatomical pathology been defined. The injury appears to be relatively unique to cricket bowlers although, anecdotally, similar injuries are said to occur in javelin throwers.
Fast and medium pace bowlers are classically described as “front on”, “semi-open” or “side on”, which is in part a description of the truncal position at the time of delivery. They are also further described as having “correct” or “mixed” actions. It is possible that these factors may determine whether it is the internal or external oblique muscle that is damaged, but the number of subjects in this report was not sufficient for statistical significance, and further biomechanical analysis would be required to test this hypothesis.

The MRI scans showed increased signal on the STIR and T2 weighted images in the internal oblique in three cases, the external oblique in three cases, and the transversalis in one case, generally at or near their attachment to one or more of the lowest four ribs (fig 1). Anatomically this corresponds to the sections of the oblique muscles that are primarily responsible for lateral trunk flexion. Such signal characteristics are consistent with muscle strain, tear, or avulsion. In three cases, no abnormality was seen, suggesting that the pain may have been due to more minor muscular injury, periosteal injury, or pain referral from the thoracic spine. MRI scans did not reveal any evidence of bony injury, although anecdotally some of these injuries have been described as stress or avulsion fractures. It is not generally necessary to perform an MRI scan to make the diagnosis; the scans were performed in these patients to further our understanding of this injury. Ultrasound scanning was not analysed to determine if it was a useful tool for assessing this injury.

**CONCLUSION**
The side strain is an injury of significance in cricket bowlers. It can be recurrent and may cause lengthy periods of absence from play. The clinical presentation and MRI findings are primarily those of a muscle injury. At present, the only identifiable risk factor is a history of a previous side strain. Further research will be aimed at determining the predisposing factors, optimal management, and effective prevention strategies for this injury.

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