Reviewer's comment concerning “Dose–response and structural injury in the disability of spinal injury” (doi:10.1007/s00586-012-2498-2 by M. S. Patel et al.)

Rishi M. Kanna

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The article “Dose–response and structural injury in the disability of spinal injury” proposes to “establish” whether there exists a “causal” relationship between structural injury, low back pain and spinal disability.

Non-specific chronic low back pain is still an incompletely understood problem in terms of its aetiology, pathogenesis and the anatomical source of pain. Innumerable researches have been/ being conducted for many years to elucidate the aetiology and have proposed mechanical, environmental and genetic factors for low back pain. But the authors of the above work have done a very “simple” study to conclude that a causal relationship between structural injury and chronic low back pain does not exist, which is not scientific. It appears that after conducting the study, the authors have tried to bring out a post hoc analyses hypotheses and conclusions rather than planning a priori hypothesis and developing a methodology to conduct the study.

Several limitations of this publication need to be realised:

1. The authors main study group (Group 2) are patients with self-reported back pain in the workplace pursuing claims for compensation. It has been proven time and again that this group of patients have significant psychosocial overlay. This has been evident in this study also. Hence, they should not have been selected as the study group to evaluate the role of structural injury in chronic low back pain. This assumes more significance given the fact that the injury sustained by

these patients was ‘self-reported’, not quantified and not documented.

2. Epidemiological studies have quite consistently found that low back pain is associated with heavy physical work. The injury rates appear to be increased when heavy objects have to be lifted, especially from the floor level and when a twisting component is involved [1]. Bulky objects and objects requiring frequent lifting also increase the incidence of low back pain [2]. Individuals who have to drive as an occupation have a higher incidence of low back complaints [3]. Anyone who spends more than 50 % of their time sitting at their job also has a threefold increase in the incidence of a disc herniation [3].

The authors have not considered any of these factors relating to the type of job, duration of job, any previous jobs of the patients in their study before giving a strong conclusion that there is no relationship between structural injury and low back pain.

3. The authors have chosen just two of the nine Sir Bradford's criteria to assess causality. There is no reason stated why they had selected only these two.
4. Temporal relationship criterion of Sir Bradford's criteria states that the exposure must always precede the outcome. If factor “A” is believed to cause a disease, then it is clear that factor “A” must necessarily always precede the occurrence of the disease. This is the only absolutely essential criterion.

In the present study, the temporal relationship criterion was not found positive in 47 % of the study Group 2. Hence, they have concluded that since 47 % of patients had back pain previously, the structural injury incurred is not the reason for the patients' present symptoms.

R. M. Kanna (✉)
Ganga Medical Centre and Hospitals, Coimbatore, India
e-mail: rishiortho2003@yahoo.co.in

But it has been well proven in literature that repetitive and frequent injuries to the low back are one of the important reasons for low back pain. It is true in clinical practice for patients to present with acute exacerbation of chronic low back pain following an acute strain. So it is incorrect to conclude that temporal relationship did not exist in the Group 2 patients.

5. To assess the dose–response relationship, they have compared two groups of patients—Group 1 had significant spinal injury and Group 2 had self-reported structural injury. In this cause–effect assessment, the “cause” that was evaluated was “structural injury”. However, only one of the groups (Group 1) had documented structural injury to the spine. In the Group 2, there is no documented, quantified and radiologically established structural injury. It is surprising to me and unscientific to compare these two groups.

Similarly the “effect” studied is chronic back pain. I am sure that the authors would agree with me that patients in Group 1 would have had significant back pain in the acute phase consistent with the magnitude of their injury. This would have proven the dose–response relationship of Sir Bradford criteria. But they have chosen chronic back pain as their “effect”, which was absent in Group 1. As evident in the literature, chronic back pain is a multi-factorial, polyetiologic problem which cannot be studied by such a simple comparison. So in their comparison between the two groups, one group without the cause and another without the effect were compared and significant conclusions have been derived. In a dose–response relationship study, the cause and effect should have occurred in the two groups in differing quantities to assess the ‘effect’ when there are changes in the ‘dose’.

The authors have neglected this fundamental principle and wrongly concluded that there is inverse dose–response relationship with bigger injuries resulting in lesser disability.

6. The only two acceptable results in this study are that patients with significant spinal fractures may not have significant chronic disability and patients with self-reported back pain in the workplace pursuing claims for compensation have poor outcome scores. These observations are not new. Comparing these two groups of patients is like comparing apples and oranges. Also the conclusions derived out of these comparisons are too farfetched. From the analysis of the two study groups, it is wrong to conclude that patients with an injury of smaller magnitude will have poorer results than those with significant injury of larger magnitude.

The purpose of the study is not supported by the methodology. Though the results appear interesting, the conclusions are inappropriate to the results. The five main contents of the manuscript—background, purpose, methods, result and conclusion remain unrelated to each other.

Conflict of interest None.

References

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