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Letter to the Editor

What level of evidence is provided by comparative retrospective studies?

To the Editor,

We read with great interest the last issue of *OTSR* containing three highly instructive studies that used a similar analysis strategy to compare treatment outcomes in retrospective case series. One of these studies looked at the outcomes of hip arthroscopy for femoro-acetabular impingement in groups with versus without dysplasia [1], another compared the outcomes of tibial plateau fractures managed by open versus arthroscopic surgery [2], and the third compared the outcomes of ankle fusion versus arthroplasty [3]. The level of evidence indicated in the abstract is 3 for the first two studies (the first being described as a case-control study and the second as a comparative retrospective study), and 4 in the last study (described as a retrospective study). We recognise that the two groups in the first study were matched and that the authors described the group free of dysplasia as a control group. Based on the absence of a between-group difference in functional scores, the authors suggest that hip dysplasia does not contraindicate arthroscopic treatment for femoro-acetabular impingement.

Nevertheless, a case-control study is classically defined as comparing a group of cases, in which either an outcome has been observed (i.e., good patient satisfaction or score above a cut-off) or a health condition exists (i.e., a complication) to a group of controls composed of individuals who do not have the outcome or health condition [4]. These two groups are typically compared using Fisher's exact test or the chi-square test according to the exposure status (e.g., dysplasia, yes/no) with adjustment on one or more factors (e.g., type of treatment). The case and control groups are matched on demographic and general characteristics (age, sex, follow-up duration, and so on). The odds ratio associated with the variable of interest in the case group versus the control group is usually computed [5]. The event (outcome or health condition) used to define the cases always occurs after the exposure [4].

Based on these definitions, the first study [1] could be categorised as a case-control study only if the analysis assessed the effect of the exposure, i.e., of having dysplasia, and if the cases were defined as patients with good functional scores and controls as patients with poor functional scores or vice versa. However, this analysis strategy was not used.

The two other studies [2,3] used fairly similar methodologies. Consequently, we would argue that all three studies [1–3] can make the same claim to providing level 3 or level 4 evidence (depending on which guidelines are followed [6–9]) and to being categorised as comparative retrospective studies.

All the latest articles that we have had published in *OTSR* are said to provide level 4 evidence, although some used a case-control design [10–12] and others a retrospective comparative [13] or retrospective non-comparative [14,15] design. In fact, the case-control design provides a higher level of evidence.

To the best of our knowledge, the *OTSR* instructions for authors do not include clear guidelines about determining the level of evidence of a study. Might this be an appropriate time to provide such guidelines?

Disclosure of interest

The authors declare that they have no competing interest.

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Authors' contributions

All authors participated in writing the manuscript.

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