Letter to the Editor

Letter to the Editor: The 2013 Frank Stinchfield Award: Diagnosis of Infection in the Early Postoperative Period After Total Hip Arthroplasty

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To the editor,

We read the study by Yi et al. [2] with great interest. The study addresses an important topic and attempts to provide some assistance with the diagnosis of early deep joint infection following total hip replacement using commonly available diagnostic tests. It is quite evident that plenty of effort has

gone into conducting the study, especially when taking into context the rarity of periprosthetic infections. However, we still believe that there will be difficulties in the generalization and the application of some of the results provided. We would like to share our views and concerns.

Following a total hip replacement, patients can be divided roughly into three groups regarding the presence or absence of infection in the joint. The first group are those patients who are well and do not have any evidence or suspicion of an infection and are discharged from the hospital within the first few days with no early or late complications; this is the completely healthy group. The second group are those patients who have a deep joint infection that is easily diagnosed based on clinical grounds as well as

serological and radiological tests. This group does not usually present significant diagnostic challenges to the clinician. The third group is the difficult group. The patients in the third group are clinically well, but have developed inflamed and possibly leaky wounds with normal or mild elevation of serological markers. Within this group, it is difficult to distinguish between transient inflammation, superficial skin/wound infection, or even a deep joint infection, creating a diagnostic and management dilemma for the clinician.

We understand that the aim of the paper is to provide diagnostic clues to help in the management of this ambiguous group. Ideally, the whole cohort of patients would have reflected the third group. However a third of the cohort ($n = 25$ of 73) had reoperations for periprosthetic fractures or instability. The authors do not mention any suspicions regarding deep joint infection in these patients. Therefore, this proportion of patients bears no relation to the intended cohort of patients. This might also explain the wide ranges

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in C-reactive protein, erythrocyte sedimentation rate, and the percentage of polymorphonuclear neutrophils in the results.

With regards to the diagnostic tests suggested, the synovial white blood cell count appears to be the best test as evident by its area under the curve value (98%), its specificity (100%), its positive predictive value (100%) and its accuracy (94%). However, this test is not practical in situations where a superficial inflammation (possible infection) exists. This is because it would be inappropriate to introduce a needle through (or closed to) an inflamed and possibly infected area directly into a replaced joint in order to obtain a synovial aspirate. Introducing a needle could inoculate a healthy joint with bacteria from a superficially infected wound. Therefore, this particular test can almost be rendered not useable in situations such as the aforementioned scenario.

We feel that the authors might have missed a real opportunity by not attempting to stratify the risk of deep joint infection based on a model that includes all (or some) of the proposed tests with predetermined cut off values (possibly using the values proposed in the paper).

In the statistical analysis plan, there is a mention of using regression analysis but we could not find evidence of this in the results or in the discussion section. In differentiating between septic arthritis and transient synovitis of the hip in children, Kocher et al. [1] stratified the risk of septic arthritis in children according to the presence of a number of clinical and serological parameters, which seems to work well in the clinical situation. Therefore, we suggest a similar approach in tackling the problem of deep periprosthetic infections. We believe this could be more informative rather than using an isolated serological marker.

Finally, the paper has certainly served the purpose of highlighting the difficulties and the dilemma faced when diagnosing periprosthetic infections. It has also highlighted the need for further research in this field and the strife for a more informative and specific diagnostic tests for these infections.

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