Author’s response to reviews

Title: Metal ion levels in large-diameter total hip and resurfacing hip arthroplasty - Preliminary results of a prospective five year study after two years of follow-up

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Author’s response to reviews: see over
Dear Editors,

Please find enclosed our revised version of the manuscript MS: 3925757755816627:

**Metal ion levels in large-diameter total hip and resurfacing hip arthroplasty**

**Preliminary results of a prospective five year study after two years of follow-up**

We want to thank the Editors for giving us the opportunity to revise it with your constructive suggestions.

We have answered all comments and suggestions, which had been addressed in detail and revised the manuscript point-by-point using “Track Changes”.

With respect to these changes and comments, we sincerely hope that you will accept our manuscript for publication in *BMC Musculoskeletal Disorders* and we are looking forward to submitting our future work to your journal.

With kind regards,

the authors.
**Comments Reviewer 1 (Jendrik Hardes):**

1) The introduction is too long and focuses too intensively to toxicological side effects. This is not the topic of this study.

   **Authors:** (Page 3) *The introduction has been shortened by reducing the information concerning toxicologic side effects due to metal ion increasement as suggested by reviewer 1.*

2) The author should precise, in which patients THA and in which hip resurfacing was indicated.

   **Authors:** (Page 5) *As mentioned by reviewer 1, it has been shown in the Methods section in whom patients the resurfacing device was used.*

**Comments Reviewer 2 (Paul Zalzal):**

1) Page 3 under Background section: it is stated “In case of large diameter hip arthroplasty devices the acetabular component is identical to the one used in standard hip arthroplasty.” This is not true for all manufacturers.

   **Authors:** (Page 3) *This statement has been deleted, also to reduce the length of the Introduction.*

2) Page 5 under methods: “during the study period 4 patients of the THA group required replacement of the contralateral hip....” did they get metal on metal or metal on poly? Do any patients have metal on metal on the other side?

   **Authors:** (Page 5) *In all four patients the same metal-on-metal device was used for THA of the affected contralateral hip. This has been mentioned in the Methods section of the manuscript.*

3) “All blood samples were collected on equal setting conditions” on page 5. What does that mean?

   **Authors:** (Page 5) *We wanted to describe that all blood samples were collected in the same room under the same spatial and surrounding conditions. Due to the confusion, the statement has been deleted.*
4) Page 5 under radiological analysis, a figure should be used to define inclination angle and arc of cover.

**Authors:** Additional figures (Figure 1a&b) describing the measurement of inclination and arc of cover has been added as suggested by reviewer 2.

5) Page 7 under statistical analysis. Were the resurfacing cases and THA cases pooled together when looking for correlation between inclination and coverage and ion level?

**Authors:** (Page 7) The correlation coefficient was calculated separated for each implant group.

6) Page 8 under results “Consequently, there were not significant correlations between the concentrations of metal ions in the serum, the inclination of the acetabular component ...” This statement is misleading. It leads the reader to believe that it there exists no correlation between these values however the sample size was too small to prove there are no correlations. The authors have identified that they were not powered to prove no correlation. The study “failed to show” a correlation, possibly because it was under powered. Again in the discussion on page 11 it is stated “On the other hand the recent study showed no correlation between the metal ion levels in the serum, the inclination of the acetabular component, and the arc of cover.” If this refers to the current study, this statement is not true. The study was not powered to show that no correlation exists.

**Authors:** (Page 8 & 11) The statement has been corrected as mentioned by reviewer 2.

7) Discussion page 11 “a relationship between increase wear of the metal-on-metal articular surface and the incidence of soft tissue lesions...” This topic is not related to the current study and this section of the discussion is not necessary in my opinion.

**Authors:** (Page 11) This section of the Discussion has been deleted.

8) Page 3. “total hip replacement” is abbreviated to THA. It should be total hip arthroplasty abbreviated to THA or total hip replacement as THR.

**Authors:** (Page 3) The expression has been corrected as suggested by the reviewer.
9) Page 3: “...within the hip joint, the periarticular soft tissues, systemically and in the liquor” this does not make sense.

**Authors: (Page 3)** *The statement concerning the metal ion concentration within the liquor has been deleted.*

10) Page 6 “A second tube was stored at the department at -20 Celsius furthering order to .....” this sentence is not well written and is confusing.

**Authors: (Page 6)** *The reason for storing a second tube has been described in the Metal ion sampling section of the Methods.*

11) The discussion section in my opinion is too long.

**Authors: (Page 11)** *The discussion has been shortened as suggested by deleting the paragraph concerning soft tissue mass development due to metal debris.*