Ion levels in the blood of patients with metal-on metal (MoM) hip joint articulation. Does storage of blood samples matter?

Short poster presentation

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Abstract:

**Background:** Wear and elevated chromium (Cr) and cobalt (Co) levels from metal-on-metal articulations may be related to adverse effects. A recent British Medical device alert has suggested monitoring at-risk patients using blood metal ions as one of the diagnostic tools. Usually the blood sample is frozen immediately and shipped frozen for analysis. Simply posting the sample in the mail would simplify the cost and logistics of metal ion testing. **Purpose:** The aim of this study is to find out whether the metal ion value in the blood is stable when it is kept at room temperature.

**Methods:** Following sample size calculations based on a Co and Cr value of 1 ppb, a sd of 0.05 and a MIREDIF of 0.2 ppb eight patients with large diameter MoM joint articulations were included after informed consent. Using ICP-SFMS we compared levels of Cr and Co in whole blood samples frozen immediately, after four and thirty days. The data were analysed in STATA 11.1 using Limits of agreement. **Findings:** We found Co ranging from 0.64 to 10.9 ppb and Cr from 0.76 to 5.16 ppb. There was no systematically reduction in the mean level of Cr and Co of the eight patients as we compared results from the blood frozen immediately with the blood frozen after four and after thirty days. There was a tendency to greater variation (limits of agreement) in the results of the individual blood samples after four and after thirty days, but these increases were non-significant (p values: 0.21, 0.71, 0.08, 0.23).

**Conclusion:** In a population of patients with MoM joint articulations the variation of Co and Cr ions in blood kept at room temperature up to thirty days is within clinically acceptable levels for diagnosing excess wear and monitoring pseudotumour at-risk patients.