

Effects of Femoral Head Size on Serum Cobalt and Chromium Levels Following Hip Resurfacing

D Gordon Allan, MD, Springfield, IL (b – Corin U.S.A.)

Brad Dyrstad, BS (n)

Joseph C Milbrandt, PhD (n)

Abstract: Metal-on-metal (MOM) hip resurfacing devices are known to release metal ions locally and into the systemic circulation. Previous studies suggest that larger prosthetic head size will correlate to reduced wear properties and may result in lower systemic release of metal ions. This project assessed the effect of femoral head size on serum cobalt (Co) and chromium (Cr) levels in subjects after unilateral hip resurfacing with the Cormet 2000 prosthesis. We prospectively collected patient characteristics, outcome, and serum samples from device implanted subjects at 6 months, 1, 2, and 3 years following surgery. Serum Co/Cr levels were determined using high-resolution inductively coupled plasma mass spectrometry. Students t-test was used to compare ion levels in two groups based on femoral head size (less than 48mm and equal to or greater than 48mm). Spearman correlation was used to examine correlations between ion levels and patient characteristics. 35 subjects (20 male) were followed. Co/Cr levels were increased at all time points when compared to control levels. A significant negative correlation was observed between Co and Cr levels and femoral head size. Co/Cr levels in subjects with larger femoral heads were significantly lower when compared to those implanted with smaller heads (Co, -35.8 percent; Cr, -33.0 percent). **Elevated serum Co/Cr levels were observed at all time points following implantation and in subjects with femoral heads less than 48mm when compared to those receiving larger components.** Based on these findings, optimization and utilization of a larger head should be considered and is warranted in light of concern over elevated trace metals following MOM resurfacing.