

The causes and pathway of failed metal-on-metal hip-implants in patients

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The paper "The Causes and Pathway of Failed Metal-On-Metal Hip-Implants in Patients" is an exciting example of a term paper on health sciences & medicine. Metal on metal hip implants is built from a cobalt-chromium alloy that is placed on the hips of people in most parts of the world. However, this procedure has been found dangerous to its patients in the recent past. In essence, the surgeons concerned with this kind of implants surgery have come out to reveal that, although these implants have been a great relieve for most of their patients, they have eventually become risky because they have significant wear out through metal wear debris (Catelas and Wimmer 2011). Scientists have now revealed that "the inflammation in tissues surrounding failing chromium -cobalt metal -on - metal (MOM) implants is caused by the release of cobalt from the metal debris that wears away from replacement joints" (Hallab 2001, p. 736). This is argued to be as a result of corrosion when in contact with body fluids. Additionally, it also argued that corrosion can occur as a result of friction between one metal hip parts rubbing against another (Scott, et al 2011). This kind of corrosion that emanates as a result of body fluids or friction causes metal debris to enter the circulation system of the body, leading to elevation metal blood levels. Ions are genotoxic and are said to lead to further medical complications. Most patients in the, especially in the United Kingdom and other parts of the world, have had cobalt-chromium alloy surgeries. However, most of these people were recalled since their surgeries had complications of adverse rubbing between the components, to cause nanoscopic metal debris to be released hence causing chronic inflammation and mobility loss in most of the patients (Ostlere, et al 2011).

Failure of metal on metal implant could also be caused by dubious surgery on the patients. Use of large diaphragms (metal cup and metal ball), which slide against each other especially when patients are walking or running, leads to tiny metal elements to wear off and enter into the space around the implant (Hart, 2009). With technical structures that do not match the patients hip structure metal implants that are found on the metal-on-metal implants which, result from the metal implants been coupled with bigger heads leading to painful movement of joints and high levels of metals ions in the tissues and blood accompanied by high rates of joint failure (Whiteside, Lange, Capello and Fraser 1983). This happens when the patient is going through a surgery or when a patient tries to move around (Dowson, Hardaker, Flett and Isaac, 2004). This further leads to the instant killing of the tissue and spurring of the inflammatory process (Scheerlinck, Deport and Kiewit 2010). In several occasions, patients who have been implanted with “large metal-on-metal implants have discovered pseudotumors growing in the tissues that surround the metal hip” (Rooker and Wilkinson 1980, pp. 506).

Examples of failed MOM Implants that have been recalled and removed from the market of the implant include the Deputy ASP hip implant which was caused by premature failure resulting to numerous revised surgeries (Taher and Power 2003).

It is also argued that when metal debris circulates through the blood, they mix with proteins to cause an immune system reaction due to the debris being foreign resulting to an allergic reaction (Corten, et al 2011. In addition, the immune system causes an extra complication which leads to rejection of

replacement and osteolysis, a process of bone dissolving. Naturally, the white blood cells begin to attack the metal as a foreign invader; as a result, bone dissolves and makes the artificial joints weak (Langton, et al 2008). On the other hand, hip replacement utilizes a larger diameter femoral heads leading to the increased range of motion and improvement and the stability of the joints one of the common complication that is associated with total hip replacement (Dunstan, et al 2008). Moreover, the surgical factor such as the cup and head positions and laxity of surrounding tissues and muscles contribute to the wearing out of metal (Donald, 1990). It has also been found out that the strain distribution on the acetabular aspect is widely affected by the fact that metal components are stiff.

Conclusion

It has been found out that metal-on-metal implants significantly wear out through metal wear debris. The inflammation in tissues surrounding failing chromium -cobalt metal -on - metal (MOM) implants is caused by the release of cobalt from the metal debris that wears away from replacement joints. Corrosion can occur as a result of friction between one metal hip parts rubbing against another.