PREGNANCY OUTCOME AFTER METAL-ON-METAL HIP ARTHROPLASTY: A CASE REPORT

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OBJECTIVE:

Metal-on-metal hip prostheses are used in young patients, including women of childbearing age.

Advantages: strength, decreased wear rate, reduced risk of dislocation

Disadvantages: excess release of metal debris, especially chromium and cobalt, inducing:

- **local toxicity**: soft tissue inflammatory reactions, tissue necrosis and osteolysis are reported and can lead to implant failure and revision surgery.
- **systemic toxicity**: cardiomyopathy, neurotoxic effects and thyroid dysfunction are described. Possible carcinogenic and mutagenic properties have also been suggested.

High-doses of chromium and cobalt during pregnancy can result in reproductive adverse effects in experimental animals. However, few clinical observations with elevated concentration of these metals have been reported in human pregnancies and none of them was associated to an increased risk of congenital malformation.

A 36-year-old primipara called the Teratology Information Service (TIS) of Careggi University Hospital due to high chromium and cobalt level detected in her urine and blood tests. A unilateral metal-on-metal hip arthroplasty was performed 13 years earlier for a femoral head aseptic necrosis. Thereafter, radiological tests were performed annually showing an initial implant wear rate with metal debris in the periprosthetic tissue at age 31. Moreover, at age 32 she accidentally fell and an x-ray showed 3 periprosthetic microfractures with no surgery indication potentially contributing to the high blood level of these metals1. In 2013 she became pregnant and blood cobalt and chromium concentrations were determined for the first time at 31th week of gestation (Tab. 1).

As no clinical systemic symptoms were present, chelating therapy was not indicated. A healthy female infant was delivered by caesarean section at week 39 (Tab. 2). High chromium and cobalt serum concentrations were detected in both mother and child (Tab. 1). A neonatal developmental long term follow-up program will be performed.

CONCLUSION:

Although in 2010 the Expert Advisory Group of the British Committee on the Safety of the Devices recommends that women should be advised to postpone pregnancy at least two years after metal-on-metal hip implantation, in our case high chromium and cobalt concentrations were detected far beyond that period (13 years). Mechanical dysfunctions can occur many years after the implantation and poorly-functioning implants can increase metal ion serum levels.

According to previous studies2,3,4, the placenta does not seem to prevent cobalt and chromium transfer to the fetus but can exert a modulatory effect on the rate of metal ion transportation. Our case is in agreement with previously described cases2 showing no reproductive risk in hip-replacement women with high chromium and cobalt levels. This observation could contribute to enable women in childbearing age with metal-on-metal hip arthroplasty and high chromium and cobalt level to plan their pregnancies or to avoid unnecessary elective termination.

References