Value of Platinum Levels in Hair as a marker of gel bleed in Women with Silicone Breast Implants and Systemic Symptoms

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Abstract

Statement of the Problem:

Since their introduction in the 60's, silicone breast implants have been a serious topic of debate. They have been linked to a cluster of systemic symptoms, currently referred to as breast implant illness. The debate reignited after silicone breast implants were shown to be associated with breast implant associated - anaplastic large cell lymphoma, raising new concern regarding silicone breast implant-induced inflammation. It was suggested that compounds present in silicone breast implants, e.g., silicone particles or heavy metals such as platinum, migrate into the body and cause systemic symptoms in susceptible women. Platinum is used as a catalyst during production of silicone elastomers. Recently, it was recommended to measure platinum levels in hair as an indicator for silicone gel-bleed in women with systemic symptoms. We aim to investigate possible associations between platinum levels in hair, in the presence or absence of silicone gel-filled breast implants and breast implant illness.

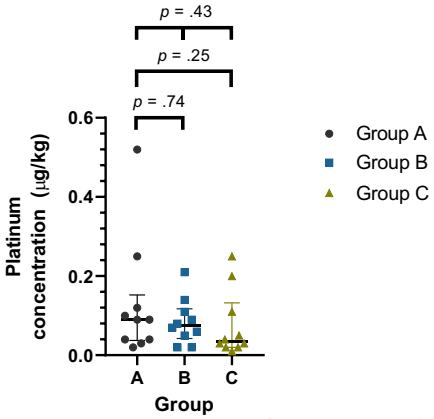


Fig. 1 Individual median platinum concentration of women with SBI and BII (group A), women with SBI and no BII (Group B) and control (Group C). Bar represents median. Error bars indicate interquartile range. *p* values indicate Kruskal-Wallis H and Mann-Whitney testing with levels of significance.

Methodology

Patients who visited our silicone outpatient clinic at Amsterdam UMC. Platinum concentration in hair samples of 10 women with breast implants and systemic symptoms (Group A), were compared to 10 women with breast implants but no symptoms (Group B), and a control group of 10 women (Group C), using laser ablation inductively coupled plasma mass spectrometry.

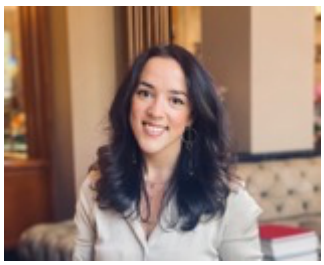
Findings

A median platinum concentration of 0.09 µg/kg [IQR 0.04-0.15] was found in group A, 0.08 µg/kg [IQR 0.04-0.12] in group B and 0.04 µg/kg [IQR 0.02-0.13] in group C, with no statistically significant difference between the groups (p = 0.43).

Conclusion & Significance

There was no statistically significant difference in hair platinum levels between the groups. Therefore, we do not recommend this test for clinical use.

Biography



Ms. dr. S. Azahaf is currently a PhD candidate at the Amsterdam University Medical Center (AUMC) in the Netherlands. She obtained her Master of Science with distinction in 2021 and has been involved in research regarding systemic symptoms in women with silicone breast implants for two years. The team of physicians have seen hundreds of patients visiting the silicone outpatient clinic at AUMC. This unique clinic allows for novel research opportunities. She currently focusses her research on the search for a biomarker for breast implant illness in order to elucidate the pathophysiology, develop a diagnostic trajectory and improve treatment options. Her colleague dr. K.A. Spit and supervisor Prof. dr. P.W.B.Nanayakkara work closely with immunologists, plastic surgeons, allergologists and radiologists. Their work is sponsored by the Dutch Ministry of Health, Welfare and Sport.

Publications from the team

1. Spit, K. A., Azahaf, S., de Blok, C., & Nanayakkara, P. (2022). Measuring Platinum Levels in Hair in Women with Silicone Breast Implants and Systemic Symptoms. *Plastic and reconstructive surgery. Global open*, *10*(6), e4373. https://doi.org/10.1097/GOX.0000000000004373
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3. Todorov, T. I., de Bakker, E., Smith, D., Langenberg, L. C., Murakata, L. A., Kramer, M., Centeno, J. A., & Nanayakkara, P. (2021). A Case of Silicone and Sarcoid Granulomas in a Patient with "Highly Cohesive" Silicone Breast Implants: A Histopathologic and Laser Raman Microprobe Analysis. *International journal of environmental research and public health*, *18*(9), 4526. https://doi.org/10.3390/ijerph18094526
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5. Maijers, M. C., de Blok, C. J., Niessen, F. B., van der Veldt, A. A., Ritt, M. J., Winters, H. A., Kramer, M. H., & Nanayakkara, P. W. (2013). Women with silicone breast implants and unexplained systemic symptoms: a descriptive cohort study. *The Netherlands journal of medicine*, *71*(10), 534–540.