Letters to the Editor

Talc and Anti-MUC1 Antibodies

To the Editors: Cramer et al. (1) present very intriguing findings on anti-MUC1 antibodies and their relationship to ovarian cancer risk factors in healthy women, raising new theories on the role of immunity in ovarian cancer and opening up avenues for new research in this area. The analysis is straightforward, yet the conclusion about genital talc exposure increasing ovarian cancer risk via diminished antibody levels is not supported by their own data. Talc exposure was characterized as ''none,'' ''body use only,'' and ''genital use.'' Antibody levels were appropriately classified as ''negative,'' ''low,'' ''intermediate,'' and ''high.'' The overall unadjusted χ^2 P value is 0.01 but an analysis limited to none and body use only yields a strong association as well (P = 0.09). The genital use group had significantly lower intermediate levels of antibodies than the none group but an analysis of the body use only group also shows a significantly lower intermediate levels than the none group (P = 0.01). There is no biological expectation that using powder on the armpits or other skin surfaces above the perineum would affect MUC1 expression. Similarly, it seems highly unlikely that talc exposure on the superficial layers of female genitals could indirectly cause ovarian cancer by reducing antibodies. Talc from genital dusting could translocate to the ovaries but this speculative assumption was ruled out years ago by electron microscopy studies showing no relationship between genital dusting and ovarian talc particle concentrations (2).

Joshua Muscat
Penn State College of Medicine
University Park, Pennsylvania

Michael Huncharek
Marshfield Clinic
Marshfield, Wisconsin

References

1. Cramer DW, Titus-Ernstoff L, McKolanis JR, et al. Conditions associated with antibodies against the tumor-associated antigen MUC1 and their relationship to risk for ovarian cancer. Cancer Epidemiol Biomarkers Prev 2005;14:1125–31.
2. Heller DS, Westhoff C, Gordon RE, Katz N. The relationship between perineal cosmetic talc usage and ovarian talc particle burden. Am J Obstet Gynecol 1996;174:1507–10.

In Response: We predicted in our article that there would be skepticism on our claim that talc use might affect systemic immunity to MUC1. Muscat and Huncharek cite three counterarguments that use of talc in the genital area might lower protective antibodies against MUC1: (*a*) use of talc as a body powder other than in the genital area also apparently had some effect on antibody levels; (*b*) there is no biological expectation that use of talc on skin surfaces could affect anti-MUC1 antibodies; and (*c*) the assumption that talc can reach the ovaries to exert a carcinogenic effect has been ''ruled out'' by one study. Regarding the first point, we agree that in an analysis adjusted only for age and looking simply at the presence or absence of antibodies, talc use in nongenital areas also had an effect on ''intermediate'' antibody levels similar to genital use. However, by a continuous measure of antibody presence (mean absorbance), genital use had the greatest effect. In addition, we stressed that in constructing our model, it was necessary to take into consideration the constellation of exposures a woman has had to predict antibody levels and her risk for ovarian cancer. In these models, it was genital use which had the greater effects. Muscat and Huncharek also argue that one would not predict talc to have any systemic effect on antibodies through skin surfaces such as that on the perineum. Responding, we did not argue that talc might diminish anti-MUC1 antibodies by the effects on cornified epithelium, which does not express MUC1. Rather, the vagina, endocervix, endometrium, and tubal epithelium are not cornified, do express MUC1, and may be subject to the effects of talc exposure. This brings us to the third point. Although we believe Muscat and Huncharek overstate the evidence that talc cannot reach the ovaries, our new observations about the basis for a relationship between talc use and ovarian cancer do not require talc to reach the ovaries; it need only reach the lower genital tract. Preliminary data we have developed and presented at the 13th Specialized Program of Research Excellence Investigators' Workshop, July 2005 (Abstract 091), indicate that exposure of vaginal cell cultures to 1% talc solution can significantly express increase levels of heat shock proteins—important immune modulators. Thus, we believe that our new theories about MUC1, ovarian cancer, and events affecting genital tract epithelium will provide a strong biological basis, which many feel has been lacking, to explain the talc and ovarian cancer association.

Daniel W. Cramer
Ob/Gyn Epidemiology Center, Brigham and Womens Hospital,
Boston, Massachusetts

doi:10.1158/1055-9965.EPI-05-0395