Article:
Vishaal Gupta and Marcus Q. Bernardini
Algorithms Used in Ovarian Cancer Detection: A Minireview on Current and Future Applications.
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Guest: Dr. Vishal Gupta is a 4th year resident in Obstetrics and Gynecology at the University of Toronto.

Randye Kaye: Hello, and welcome to this edition of "JALM Talk," from *The Journal of Applied Laboratory Medicine*, a publication of the American Association for Clinical Chemistry. I'm your host, Randye Kaye.

Ovarian cancer is the fifth most common cause of cancer death among women in the U.S. The high rate of mortality for ovarian cancer is multifactorial, but it is estimated that more than 60% of cases have already metastasized at the time of diagnosis. Despite more invasive surgical treatments and targeted chemotherapies, ovarian cancer survival rates have remained similar over time. "Algorithms Used in Ovarian Cancer Detection: A Minireview on Current and Future Applications" was published in the September 2018 issue of *the Journal of Applied Laboratory Medicine*. The review outlined some of the challenges associated with the diagnosis of ovarian cancer and highlights how our understanding of the biology of ovarian cancer has changed. The authors are Dr. Vishaal Gupta, a 4th year resident in Obstetrics and Gynecology at the University of Toronto, and Dr. Marcus Bernardini, Head of the Division of Gynecologic Oncology at the University Health Network and Mount Sinai Hospital in Toronto. Dr. Gupta is joining us today. Welcome.

Vishaal Gupta: Hi, Randye.

Randye Kaye: You and Dr. Bernardini present a novel approach to ovarian cancer emphasizing the importance of histotype specific screening. Why do you think this is one of the first reviews mentioning this?

Vishaal Gupta: So, I think the big thing is oncology is an ever-evolving field with improved technology, new staining, and a better understanding of tumor biology. We finally are able to better understand the differences between each histotype and now that we can understand these differences, we are able to detect new molecular differences that are pretty novel. We always knew that there were multiple histotypes and they behaved differently clinically, but now we actually

have a molecular reason behind it and we can form more targeted approaches.

Randye Kaye: That's great. Now, CA-125 has been studied and used for many years in patients with ovarian cancer. How would you advise others on its use going forward?

Vishaal Gupta: I think we have to be very careful. I know it's one of the first ever molecular biomarkers that were able to detect an ovarian cancer, but it has to be used only in specific situations. We have to remember that it is elevated in less than 50% of early stage or unilateral ovarian cancers and it's only been approved for disease surveillance and recurrence. Therefore, the CA-125 is neither sensitive nor very specific in premenopausal women. We've often put a lot of weight on the CA-125, but I think it's important to look at the whole clinical picture of the patient as a whole every time.

Randye Kaye: Okay, that makes a lot of sense. Now, you mentioned endometrioid and clear cell carcinoma separately. Do you think screening for these histotypes is more realistic than serous ovarian cancer?

Vishaal Gupta: In order to answer that question, we kind of have to take a step back and really define what screening means. The key to screening is identifying the disease early enough in the process that we can successfully intervene and make a difference in survival and recurrence down the road. Previous studies have shown that endometrioid and clear-cell carcinoma do present much earlier than a high-grade serous ovarian cancer. So, therefore, yes. I think it is something that we can potentially successfully implement screening for. High-grade serous ovarian cancer still predominantly presents late with over 95% of stage III or beyond, and until we are able to determine earlier, molecular screening won't be feasible for this cell type.

Randye Kaye: Thank you. Imaging modalities are often used by many primary care providers and generalists worldwide. What do you think of its use in diagnosing and triaging pelvic masses?

Vishaal Gupta: That's a good question, Randye. I think, again, as I've mentioned earlier with the CA-125 and kind of what this whole paper was trying to get at is that screening remains challenging. For serous cancer, by the time imaging findings are positive, the disease has likely already disseminated and pretty advanced. It's probably most important for the other histotypes where CA-125 is less reliable. We want to make sure everyone is aware that its role has shown benefits in diagnosing patients, not in screening. So, therefore, imaging is more of a diagnostic

tool than a screening tool and, again, it has to be used very carefully.

Randye Kaye: Okay. This is very important information. So, my last question is, what are important future research directions that could improve ovarian cancer screening?

Vishaal Gupta: I think what we need to do is go back to the basics of screening. We need to be able to identify molecules released early on enough in the disease process to detect before the disease has become disseminated.

Given what is presented in this article, it is clear that we also need to approach each histotype as a unique screening test. Future preclinical basic science testing of tumor biology needs to identify these molecules that are released at the start of oncologic transformation. Unfortunately, we don't have any good molecules at this point. However, there have been some studies that have identified, as mentioned in this review, potential future markers but, however, further studies need to be arranged to assess its clinical applicability.

Randye Kaye: Thank you so much. Anything you want to add before we close the podcast?

Vishaal Gupta: I think overall, our main goal for this review paper was to discuss the importance of histotype-specific screening and I think that's the main thing we need to get. That we want to come across. And the main point I want to make is that it's important going forward to actually identify each histotype separately.

Randye Kaye: All right, thank you so much for joining me today.

Vishaal Gupta: Okay. Thank you, Randye.

Randye Kaye: That was Dr. Vishaal Gupta, a 4th year resident in Obstetrics and Gynecology at the University of Toronto, talking about "Algorithms Used in Ovarian Cancer Detection: A Minireview on Current and Future Applications" from the September 2018 issue of JALM, which he authored with Dr. Marcus Bernardini. Thanks for tuning in to this episode of "JALM Talk." See you next time and don't forget to submit something for us to talk about.