Expert second opinion improves reliability of melanoma diagnoses

October 11 2019

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Getting a reliable diagnosis of melanoma can be a significant challenge for pathologists. The diagnosis relies on a pathologist's visual assessment of biopsy material on microscopic slides, which can often be subjective.

Of all pathology fields, analyzing biopsies for skin lesions and cancers has one of the highest rates of diagnostic errors, which can affect millions of people each year.

Now, a new study led by UCLA researchers, have found that obtaining a second opinion from pathologists who are board certified or have fellowship training in dermatopathology can help improve the accuracy and reliability of diagnosing melanoma, one of the deadliest and most aggressive forms of skin cancer.

"A diagnosis is the building block on which all other medical treatment is based," said Dr. Joann Elmore, a professor of medicine at the David Geffen School of Medicine at UCLA and researcher at the UCLA Jonsson Comprehensive Cancer Center. "On the other end of these biopsies are real patients: patients answering the late-night, anxiety-inducing phone calls when we inform them of their diagnosis; patients undergoing invasive surgeries; patients weighing their next clinical steps. All patients deserve an accurate diagnosis. Unfortunately the evaluation and diagnosis of skin biopsy specimens is challenging with a lot of variability among physicians."

In the study, led by Elmore and her colleagues, the value of a second opinion by general pathologists and dermatopathologists were evaluated to see if it helped improve the correct diagnostic classification.

To evaluate the impact of obtaining second opinions, the team used samples from the Melanoma Pathology Study, which comprises of 240 skin biopsy lesion samples. Among the 187 pathologists who examined the cases, 113 were general pathologists and 74 were dermatopathologists.

The team studied misclassification rates, which is how often the diagnoses of practicing US pathologists disagreed with a consensus

reference diagnosis of three pathologists who had extensive experience in evaluating melanocytic lesions. The team found that the misclassification of these lesions yielded the lowest rates when first, second and third reviewers were sub-specialty trained dermatopathologists. Misclassification was the highest when reviewers were all general pathologists who lacked the subspecialty training.

"Second opinions in clinical medicine can increase accuracy, which is a win-win for patients and providers—better diagnoses lead to better outcomes and efficient use of our healthcare expenditures. This is definitely something that healthcare providers should consider when faced with these complex and challenging to diagnose skin biopsies. Our results show having a second opinion by an expert with subspecialty training provides value in improving the accuracy of the diagnosis, which is imperative to help guide patients to the most effective treatments," said Elmore, who is also the director of the UCLA National Clinician Scholars Program.

"While these finding suggest that second opinions rendered by dermatopathologists improve overall reliability of diagnosis of melanocytic lesions, they do not eliminate or substantially reduce misclassification."

Elmore is now studying the potential impact of computer machine learning as a tool to improve diagnostic accuracy. She is partnering with computer scientists who specialize in computer visualization of complex image information, as well as leading pathologists around the globe to develop an artificial intelligence (AI)-based diagnostic system.

According to a report by the National Academies of Sciences, Engineering, and Medicine, improvements in the diagnostic process are a "moral, professional, and public health imperative."

Provided by University of California, Los Angeles