SIBLING proteins may predict oral cancer

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Dr. Kalu Ogbureke is an oral and maxillofacial pathologist in the MCG School of Dentistry. Credit: Medical College of Georgia

The presence of certain proteins in premalignant oral lesions may predict oral cancer development, Medical College of Georgia researchers said.

SIBLINGs, or Small Integrin-Binding Ligand N-linked Glycoproteins, are a family of five proteins that help mineralize bone but can also spread cancer. SIBLINGs have been found in cancers including breast, lung, colon and prostate.

"Several years ago we discovered that three SIBLINGs—osteopontin, bone sialoprotein and dentin sialophosphoprotein—were expressed at significantly high levels in oral cancers," said Dr. Kalu Ogbureke, an oral

and maxillofacial pathologist in the MCG School of Dentistry. "Following that discovery, we began to research the potential role of SIBLINGs in oral lesions before they become invasive cancers."

The study, published online this week in the journal *Cancer*, examined 60 archived surgical biopsies of precancerous lesions sent to MCG for diagnosis and the patients' subsequent health information. Eighty-seven percent of the biopsies were positive for at least one SIBLING protein—which the researchers discovered can be good or bad, depending on the protein. For instance, they found that the protein, dentin sialophosphoprotein, increases oral cancer risk fourfold, while bone sialoprotein significantly decreases the risk.

"The proteins could be used as biomarkers to predict [the potential of a lesion to become cancerous]," said Dr. Ogbureke, the study's lead author. "That is very significant, because we would then be in a position to modify treatment for the individual patient's need in the near future."

Precancerous oral lesions, which can develop in the cheek, tongue, gums and floor and roof of the mouth, are risk factors for oral squamous cell carcinoma, which accounts for over 95 percent of all oral and pharyngeal cancers. Oral cancer, the sixth most common cancer in the world, kills about 8,000 Americans annually, Dr. Ogbureke said.

Treatment has been stymied up to this point because of clinicians' inability to predict which lesions will become cancerous. Surgery is standard for oral cancer, but treatment methods vary for precancerous lesions.

"When we treat these lesions now, there's an implied risk of under- or over-treating patients," Dr. Ogbureke said. "For example, should the entire lesion be surgically removed before we know its potential to become cancer, or should we wait and see if it becomes cancer before

intervening?"

Further complicating the matter is that the severity of dysplasia, or abnormal cell growth, in a lesion can be totally unrelated to cancer risk. Some mild dysplasias can turn cancerous quickly while certain severe dysplasias can remain harmless indefinitely. The protein findings, which help eliminate the guesswork in such cases, "are fundamental," Dr. Ogbureke said. "If we're able to recognize these lesions early and biopsy them to determine their SIBLING profile, then oral cancer could be preventable and treatable very early."

Dr. Ogbureke's next step is to design a multi-center study that incorporates oral cancer risk factors, such as smoking and alcohol consumption, to further investigate their relationship with SIBLING protein expression.

Provided by Medical College of Georgia