Medical Xpress

Low-dose sorafenib may improve therapy for head and neck cancer

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Adding low doses of the targeted agent sorafenib to the chemotherapy and radiation now often used to treat head and neck cancer might significantly improve patient care and quality of life, according to a new study by researchers at the Ohio State University Comprehensive Cancer Center-Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (OSUCCC – James).

The findings suggest that adding sorafenib would maintain treatment efficacy while permitting the use of lower doses of chemotherapy and radiation and decreasing the treatment's harsh side effects. The triple combination was well-tolerated in an animal model.

About 49,200 new cases of head and neck cancer are expected in the U.S. this year, and 11,500 people are expected to die of the disease. Treatment is often unsuccessful because the tumors become resistant to both chemotherapy and radiation therapy.

"This pre-clinical study suggests that using low-dose sorafenib along with chemotherapy and radiation could have significantly milder side effects while maintaining effectiveness," says researcher and principal investigator Dr. Pawan Kumar, assistant professor of otolaryngology and a neck surgeon at the OSUCCC – James.

"Our findings provide a scientific rationale to evaluate this combination strategy through a clinical trial," Kumar added.

The results of the laboratory and animal study are published online in the journal *Molecular Cancer Therapeutics*, and they include the following:

- Sorafenib sensitized tumor cells to chemotherapy and radiation treatment by down-regulating DNA repair proteins (ERCC-1 and XRCC-1), and it decreased tumor angiogenesis by inhibiting VEGF-mediated signaling.
- The combination treatment was well tolerated in a mouse model and significantly inhibited tumor growth and tumor angiogenesis; low-dose sorafenib alone was an effective maintenance regimen.
- The combination treatment significantly inhibited tumor-cell migration, invasion and the formation of new tumor blood vessels in laboratory studies.

"Taken together, our results suggest a potentially novel strategy in which sorafenib combined with low doses of chemotherapy, radiation therapy, or both is as effective in the treatment of head and neck cancer as much higher doses used in existing treatment approaches," says study co-author Dr. Theodoros N. Teknos, professor of otolaryngology, director of head and neck oncologic surgery, and the David E. and Carole H. Schuller Chair in Head and Neck Oncologic Surgery. "As a result, it may be possible to design new treatment regimens that limit side effects of therapy without decreasing cure rates."

Provided by Ohio State University Medical Center