Standard treatment for prostate cancer may encourage spread of disease

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A popular prostate cancer treatment called androgen deprivation therapy may encourage prostate cancer cells to produce a protein that makes them more likely to spread throughout the body, a new study by Johns Hopkins researchers suggests.

Although the finding could eventually lead to changes in this standard treatment for a sometimes deadly disease, the Johns Hopkins researchers caution that their discovery is far too preliminary for prostate cancer patients or physicians to stop using it. The therapy is effective at slowing tumor growth, they emphasized.

David Berman, an assistant professor of pathology, urology and oncology at The Johns Hopkins University School of Medicine, and his colleagues identified the unsuspected potential problem with treatments that suppress testosterone after discovering that the gene that codes for the protein, called nestin, was active in lab-grown human prostate cancer cells.

Curious about whether prostate cancer cells in people also produce nestin, the researchers looked for it in cells taken from men who had surgery to remove locally confined cancers of their prostates and found none. But when they looked for nestin in prostate cancer cells isolated from patients who had died of metastatic prostate cancer - in which cancer cells spread out from the prostate tumor - they found substantial evidence that the nestin gene was active.

What was different, Berman speculated, is that androgen deprivation therapy, a treatment that reduces testosterone in the body, is generally given only when prostate cancers become aggressive and likely to metastasize.

Because prostate cancer growth is typically stimulated by testosterone, the treatment is thought to slow tumor growth and weaken the disease. Patients who eventually die because their disease metastasizes are almost certain to have received this type of therapy, he says.

Speculating that depriving cells of androgens might also, however, affect nestin expression, the researchers experimented on a prostate cancer cell line that depends on androgens to grow. When they removed androgens from the chemical mixture that the cells live in, their production of nestin increased.

Aware that the nestin gene has long been suggested to play some role in cell growth and development, Berman and his colleagues used a bit of laboratory sabotage called RNA interference to decrease the genetic expression of nestin and found that these cells weren't able to move around and through other cells nearly as well as cells with normal nestin levels.

Prostate cancer cells with hampered nestin expression were also less likely than normal prostate cancer cells to migrate to other parts of the body when transplanted into mice. However, while nestin expression seemed pivotal for metastasis in these experiments, it didn't seem to make a difference in tumor growth.

"What all this suggests is that nestin levels increased when prostate cancer cells are deprived of androgens and may encourage the cells to metastasize," says Berman.

Source: Johns Hopkins Medical Institutions