

Public release date: 28-Jan-2011



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Pre-surgical stress management boosts immune function, lowers mood disturbance in prostate cancer patients

UT MD Anderson study finds brief interventions may help speed physical and psychological healing

HOUSTON - Practicing stress management techniques before prostate cancer surgery may help activate the body's immune response leading to quicker recovery, as well as aid in lowering mood disturbance, according to a new study by researchers at The University of Texas MD Anderson Cancer Center.

The study is published in the February/March edition of the journal *Psychosomatic Medicine*. It's the first to examine the effects pre-surgery stress management training has on immune outcomes in men with prostate cancer undergoing radical prostatectomy (surgical removal of the prostate). The researchers previously reported that men who received this training before surgery had significantly less mood disturbance and improved quality of life one year later.

Two levels of stress accompany surgery

"Men who face prostatectomy as treatment for prostate cancer often have high stress levels about the procedure and the potential effects on their quality of life," said Lorenzo Cohen, Ph.D., the study's senior author and professor in MD Anderson's Departments of General Oncology and Behavioral Science. "Both the physical and psychological stress of surgery can be harmful to the immune system. Even brief pre-surgery sessions of stress management positively impact on the recovery process, both in terms of psychological and immunological outcomes," he said.

Surgical stress causes a powerful inflammatory response close to the surgery site and throughout the body, raising certain cell-signaling proteins called cytokines that increase inflammation and suppress the

immune response. Psychological stress dysregulates cytokine function, reduces the function of natural killer cells and slows wound healing.

While the elevation of inflammatory cytokines may be harmful if sustained, short-term increases before and after surgery may signal an immune response that helps wounds heal and recover.

Participants received different levels of intervention

In the study, 159 men with early-stage prostate cancer who were scheduled for radical prostatectomy were randomized into three groups.

- Stress management (SM) group participants:
 - Met twice with a psychologist one to two weeks before surgery to discuss concerns and learned some cognitive techniques
 - Learned deep breathing and guided-imagery techniques to help cope with the possible effects of surgery
 - Were led through mental imagery to help prepare for surgery and hospitalization
 - Received a stress management guide that expanded on sessions and audiotapes of techniques to practice on their own
 - Had brief booster sessions with the psychologist on the morning of the surgery
 - Had a brief session 48 hours after surgery to reinforce relaxation and coping strategies
- Supportive attention (SA) group participants:
 - Met twice with a psychologist one to two weeks before surgery. Sessions were supportive and included a semi-structured psychosocial and medical history in an interview format
 - Were provided empathy and an encouraging environment in which to discuss concerns
 - Had brief booster sessions the morning of surgery
 - Had a brief session 48 hours after surgery to discuss their experiences leading up to the surgery and during their hospital stay
- Standard Care (SC) received routine medical care and had no meetings with psychologists

Blood samples were collected from each patient about a month before surgery and 48 hours after surgery.

Patient mood was measured about a month before surgery, a week before surgery (after the interventions) and the morning of the surgery.

Results show intervention benefits

Two days after surgery, the men in the SM group had:

- Significantly higher levels of natural killer function and circulating pro-inflammatory cytokines than men in the SA group
- Higher levels of natural killer function and the cytokine IL-1b than men in the SC group
- Increased immune system parameters, which decreased or stayed the same for the other two groups

The SM group also had lower mood disturbances before surgery, but this was not found to be associated with immune outcomes.

"This study and evidence from other studies show that psychological intervention before an acute stressor can be beneficial to patients," said Cohen, who is also director of the Integrative Medicine Program. "The implications are that managing stress has biological as well as psychological benefits and might have an effect on aspects of disease."

Further, Cohen says, it suggests that it's important to engage in some type of stress management during stressful periods, especially before surgery.

Next steps

Since the men who took part in this study were mostly white, non-Hispanic, married, and highly educated, researchers say additional studies are needed in more diverse populations, as well as men with advanced disease.

"We're looking at targeting future research to people who might benefit the most, in particular those who are the most distressed and have the lowest level of social support," Cohen said. "This will help provide the most benefit and effective use of health care system's limited resources."

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Research was supported by a National Institute of Mental Health/National Cancer Institute grant. The Immune Monitoring Core Laboratory at MD Anderson, which carried out the immune tests for this research, is funded by an MD Anderson Cancer Center Support Grant.

MD Anderson co-authors with Cohen were Patricia Parker, Ph.D., Qi Wei, M.S., Department of Behavioral Science; Luis Vence, Ph.D., Cheryl Savary, Ph.D., Diane Kentor, Leslie Wiltz, Tejal Patel and Laszlo Radvanyi, Ph.D., MD Anderson's Department of Melanoma Medical Oncology; Curtis Pettaway, M.D., Richard Babaian, M.D, and Louis Pisters, M.D., Department of Urology. Brian Miles, M.D., Department of Urology, Baylor College of Medicine, Houston, also contributed to the research.

About MD Anderson

The University of Texas MD Anderson Cancer Center in Houston ranks as one of the world's most respected centers focused on cancer patient care, research, education and prevention. MD Anderson is

one of only 40 comprehensive cancer centers designated by the National Cancer Institute. For seven of the past nine years, including 2010, MD Anderson has ranked No. 1 in cancer care in "America's Best Hospitals," a survey published annually in U.S. News & World Report.

