Pain studies enhance precision medicine

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In the 1980s, Christine Miaskowski, RN, PhD, was working as a clinical nurse specialist in a pain management center at the University Hospital of the Albert Einstein College of Medicine in New York.

"One day this woman walked in who couldn't move her shoulder," says Miaskowski. "She talked about the pain she'd experienced since her radical mastectomy, about how her surgeon kept telling her she was healed, and how she'd been hospitalized in a psychiatric institution as a crazy postmenopausal woman. She said if we didn't help her, she would kill herself. We were able to tell her she wasn't crazy – we knew the pain was real, a neuropathic, postsurgical pain syndrome – but as we began to explore these cases, nearly every surgeon I called told us this wasn't a real problem for their patients."

Her patients' ordeals and that of Miaskowski's own father – "who died in intractable pain from this same postsurgical syndrome" – have driven a career that has made Miaskowski an internationally respected pain researcher.

In December 2012 her work came full circle, when she and a diverse team of experts published the results of a major study in *The Journal of Pain*. The work established that after breast cancer surgery, about 25 percent of women experience persistent breast pain and 35 percent of women experience persistent arm and shoulder pain.

"It's rewarding to complete that work," says Miaskowski, now the associate dean for Academic Affairs at UC San Francisco's School of

Nursing and co-director of the Research Center for Symptom Management, one of the only such centers housed at a school of nursing in the country.

The rewards may grow if the research team she has assembled with her primary collaborator, geneticist Bradley Aouizerat, PhD, can show that incorporating genomics into a much broader group of potential factors – including environmental and psychosocial components – can help clinicians better understand which patients are at greatest risk for persistent postsurgical pain and how to better prevent or treat it.

The result would be an important refinement and broadening of the precision medicine concept, which could in turn reduce a considerable amount of human suffering and billions of dollars in health care costs.

100 million people with persistent pain – and few effective therapies

According to a 2011 report from the Institute of Medicine, 100 million Americans live with persistent pain, the treatment of which costs $635 billion every year in medical bills and lost productivity. The report was a culmination of how awareness of persistent pain as an important medical condition has grown over the last decade or so.

In the aftermath of the IOM report, Miaskowski was named one of six nonfederal scientists – and one of only three nurses – to a federal Interagency Pain Research Coordinating Committee, which is dedicated to improving pain research and patient care. In addition, UCSF recently became one of 12 National Institutes of Health Centers of Excellence in Pain Education, dedicated to making sure clinicians and those training to be clinicians are aware of best practices in pain management.

But treatment options remain limited. Despite a decade of scientific discoveries about the mechanisms, pathways and role of psychology in persistent or chronic pain – as well as advances in diagnostic tools and clinical breakthroughs in specific areas, like headache – for many types of chronic pain, effective therapies remain elusive. Highly publicized concerns about the addictive properties of opiates, one of the few known effective therapies for certain types of pain, have further constrained clinicians' options.

In the case of breast cancer, the theory is that postsurgical pain results from nerve injury. Thus the general wisdom is to try an anticonvulsant, but in Miaskowski's recent study, the most widely prescribed medications were antidepressants.

"Very few of these women were on analgesics, and we don't know why," she says.

"We've long appreciated the pain problems," says breast surgeon Charles Elboim of the Redwood Regional Medical Group, who was a co-investigator on the study. "I've always tried to listen to patients and anticipate … but doctors are different, and there may be surgeons who don't have the same appreciation of these patients' experience." For well over a decade, he has been involved in research to understand postsurgical symptoms, often working with nurse practitioner Kathleen Mott, a graduate of UCSF School of Nursing.

"I think a lot of practitioners still see the big problem – the cancer – and the symptoms are a lesser issue," says UCSF neurologist Gary Abrams, MD, a longtime research collaborator with Miaskowski and co-investigator on the breast cancer project. "But these symptoms have a significant impact on quality of life. As survival rates increase and cancer becomes more of a chronic disease, the associated symptoms will continue to rise in importance."

That's why the work of Miaskowski, Aouizerat and their team is so important. While it is still too early to generalize studies on persistent pain after breast cancer surgery to other types of pain treatment, the group's broad, precision medicine approach can offer insights for other pain researchers.

"We're trying to understand all of the characteristics of the persistent pain – to not just find the associations between the pain and genes, but also do a detailed characterization of the phenotype," says Aouizerat.

More information: www.jpain.org/article/S1526-59 … (12)00831-0/abstract

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