PAIN TRAJECTORIES AND SYMPTOMS OF SOCIAL ISOLATION AND LONELINESS IN ADULT SURVIVORS OF CHILDHOOD CANCER: A REPORT FROM THE CHILDHOOD CANCER SURVIVOR STUDY (CCSS)

Cassie M. Argenbright, PhD[1], Grace Zhou, PhD[2], Kendrick Li, PhD[2], Nicole M. Alberts, PhD[3], Cynthia Karlson, PhD[4], Ellen van der Plas, PhD[5], Eric J. Chow, MD, MPH[6,7], Vikki Nolan, MPH, DSc[8], Rebecca M. Howell, PhD[9], Kumar Srivastava, PhD[2], I-Chan Huang, PhD[8], Gregory T. Armstrong, MD, MSCE[8], Kevin R. Krull, PhD[1], Tara M. Brinkman, PhD[1]

[1]Department of Psychology and Biobehavioral Sciences, St. Jude Children's Research Hospital, Memphis, TN; USA

[2]Department of Biostatistics, St. Jude Children's Research Hospital, Memphis, TN; USA

[3]Department of Psychology, Concordia University, Montreal, QC; Canada

[4]Department of Pediatrics, Division of Hematology/Oncology, University of Mississippi Medical Center, Jackson, MS; USA

[5]Department of Pediatrics, University of Arkansas for Medical Sciences, Little Rock, AR; USA

[6]Clinical Research Division, Fred Hutchinson Cancer Center, Seattle, WA; USA

[7]Public Health Sciences Division, Fred Hutchinson Cancer Center, Seattle, WA; USA

[8]Department of Epidemiology and Cancer Control, St. Jude Children's Research Hospital, Memphis, TN; USA

[9]Department of Radiation Physics, Division of Radiation Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX; USA

TOPIC: QoL/Rehabilitation

CHARACTERS INCLUDING SPACES: (3498/3500)

BACKGROUND-AIM

Survivors of childhood cancer are at risk of developing chronic pain and social isolation/loneliness, which may persist decades following treatment. Despite shared biopsychosocial and neurobehavioral mechanisms, associations between pain and social health-related outcomes in survivors remain poorly understood. This study examined (1) cross-sectional associations between pain and social isolation and loneliness, (2) whether longitudinal pain trajectories are associated with social outcomes, and (3) the contribution of chronic disease burden to these associations.

METHODS

10,923 survivors (median age=41 years [min-max=21-70]; 52% female; 32% leukemia; 20% lymphoma; 16% CNS; 9% bone cancer; 6% soft tissue sarcoma; 10% Wilms; 7% Neuroblastoma) enrolled in the CCSS completed patient-reported assessments of pain (migraine, headache, cancer-related pain, bodily pain, pain interference) at T1 [CCSS follow-up 7 survey]. Pain status was categorized as no pain, pain without interference, or pain with interference. Social isolation was measured using the PROMIS Social Isolation scale (T-score ≥ 60), and loneliness was defined as endorsing "moderate" to "extreme" loneliness using an item from the Brief Symptom Inventory-18 (BSI-18). A subset of 7,875 survivors with T0 [CCSS follow-up 5 survey] pain data (median interval follow-up=5.04 years) was included in longitudinal analyses, in which pain trajectories (T0 to T1) were defined as none/decreasing, persistent, or increasing. Chronic health condition (CHC) burden scores were calculated using frequency and severity of CTCAE-graded conditions across cardiovascular, endocrine, musculoskeletal, neurological, gastrointestinal, and respiratory systems, and categorized as none, low, medium, high, and severe. Associations between pain and social outcomes were examined with multivariable logistic regression models adjusted for sex, age, race/ethnicity, treatment exposures, CHC burden, depression, and health behaviors (e.g., smoking, risky alcohol use).

RESULTS

At T1, 20.7% of survivors reported pain without interference; 14.3% pain with interference; 7.3% social isolation; and 12% loneliness. In cross-sectional analyses at T1, pain was significantly associated with social isolation (without interference: OR=1.74, 95% CI 1.36–2.24; with interference: OR=2.36, CI 1.80–3.08) and loneliness (without interference: OR=1.57, CI 1.25–1.97; with interference: OR=2.60, CI 2.08–3.25) in a dose-dependent manner. In longitudinal models, survivors with persistent pain from T0 to T1 had two-fold higher odds of social isolation (OR=2.07, CI 1.54–2.78) and loneliness (OR=2.03, CI 1.61–2.56) vs. survivors with none/decreasing pain. Increasing pain symptoms were also associated with significantly elevated odds of social isolation (OR=1.74, CI 1.28–2.36) and loneliness (OR=1.65, CI 1.27–2.16). Among survivors with persistent or increasing pain, risky health behaviors, but not CHC burden, increased the risk of social isolation and loneliness.

CONCLUSION

Pain and pain interference were associated with concurrent and future risk of social isolation and loneliness in adult survivors of childhood cancer, independent of CHC burden. These findings highlight social disconnection as an important yet underrecognized consequence of pain in survivors. Integrating assessment of and interventions for social isolation and loneliness into survivorship pain management may improve psychosocial well-being and long-term health outcomes.