Journal of Psychiatry
ISSN 2378-5756
2020
Vol.23 No.5

Pretreatment with Duloxetine May Prevent Chemotherapy-Induced Neuropathic Pain: A Pilot Study

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Abstract

Statement of the Problem: Approximately 70% of patients receiving oxaliplatin for colorectal cancer develop painful oxaliplatin- induced peripheral neuropathy (OIPN-P). OIPN-P can persist up to 11 years after treatment is stopped, affecting quality of life, and contributing to falls, depression, and sleep loss. OIPN-P also necessitates decreased dosage during treatment, thereby decreasing treatment effectiveness and increasing mortality risk. Recent work is suggestive that pretreating with tricyclic drugs can prevent onset of OIPN-P, but these drugs have serious side effects.

Methodology: Rats were pretreated with duloxetine (15 mg; PO) for 7 days prior to and through oxaliplatin treatment, and for 20 days post oxaliplatin treatment. Rats were then tested for 6 days after all treatment stopped. The measure used was a 15 g von Frey filament applied to the left foot, which measures hyperalgesia, a sign of neuropathic pain.

Findings: We found that rats pretreated with duloxetine presented with significantly less hyperalgesia through the testing period compared to control, and notably for the six days after all treatment stopped ($p \leq 0.003$; $p \leq 0.13$; males and females resp.).

Conclusion and Significance: These pilot study findings are suggestive of the need for further study to determine whether pretreatment with duloxetine can prevent onset of OIPN-P.

Biography:

Janean E. Holden, PhD, RN, FAAN is the Barbara A. Therrien Collegiate Professor of Nursing. She received her PhD from the University of Michigan and did post-doctoral research in Pharmacology at the University of Illinois at Chicago. Her research focus is on the role of the hypothalamus in descending pain modulation with emphasis on the role of norepinephrine in the spinal cord.

Speaker Publications:

1. Holden JE, Wagner, MA & Reeves, B. (2018). "Anatomical Evidence for Lateral Hypothalamic Innervation of the Pontine A7 Catecholamine Cell Group in Rat". Neuroscience Letters. 668:80- 85.
2. Wagner MA, Jeong Y, Banerjee T, Yang J, & Holden JE (2016). "Sex differences in hypothalamic-mediated tonic norepinephrine release for thermal hyperalgesia in rats". Neuroscience, 324:420-9.
3. Wardach J, Wagner M, Jeong Y, & Holden JE (2016). "Lateral hypothalamic stimulation reduces thermal hyperalgesia through spinally descending orexin-A neurons in neuropathic pain". Western Journal of Nursing Research 38:292-307.
4.Holden JE, Wang E, Moes JR, Wagner M, Maduko A, & Jeong Y (2014). "Differences in carbachol dose, pain condition and sex following lateral hypothalamic stimulation". Neuroscience, 270:226- 35.
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29th World Congress on Neurology and Therapeutics; London, UK- February 24-25, 2020.

Abstract Citation:

Janean E. Holden, Pretreatment with duloxetine may prevent chemotherapy-induced neuropathic pain: A pilot study, Neurology 2020, 29th World Congress on Neurology and Therapeutics London, UK- February 24-25, 2020.

(https://www.neurologyconference.com/abstract/2020/pretreatment-with-duloxetine-may-prevent-chemotherapy-induced-neuropathic-pain-a-pilot-study)