

癌痛发生机制的研究进展

《现代肿瘤医学》[ISSN:1672-4992/CN:61-1415/R] 期数: 2019年10期 页码: 1845-1848 栏目: 综述 出版日期: 2019-04-08

Title: Advances in the mechanism of cancer pain

作者: 张文颖; 姜斌

上海交通大学医学院附属第九人民医院肿瘤科, 上海 201999

Author(s): Zhang Wenying; Jiang Bin

Department of Oncology, Shanghai 9th People's Hospital, Shanghai Jiaotong University School of Medicine, Shanghai 201999, China.

关键词: 癌症; 疼痛; 机制; 肿瘤微环境

Keywords: cancer; pain; mechanism; tumor microenvironment

分类号: R730.231

DOI: 10.3969/j.issn.1672-4992.2019.10.045

文献标识码: A

摘要: 癌痛是肿瘤患者的主要症状之一,严重影响患者的生活质量。目前对癌痛产生的机制认识尚不足,癌痛的形成可能与癌细胞、肿瘤微环境、中枢神经系统以及免疫系统之间复杂的相互作用相关。深入研究癌痛产生的机制,将为临床肿瘤患者疼痛治疗提供重要的理论依据和指导方向。

Abstract: Pain is one of the most common disease complications, seriously affecting the quality of life of the cancer patient. The mechanism of cancer pain remains unclear. Cancer pain may be related to cancer, tumor microenvironment, central nervous system and immune cells. As our understanding of cancer pain mechanism that underlies cancer pain improvement, targeted analgesics for the cancer patient will likely follow.

参考文献/REFERENCES

- [1] van den Beuken-van Everdingen MH, Hochstenbach LM, Joosten EA, et al. Update on prevalence of pain in patients with cancer: Systematic review and meta-analysis [J]. *J Pain Symptom Manage*, 2016, 51(6):1070-1090 e9.
- [2] Bennett MI. Mechanism-based cancer-pain therapy [J]. *Pain*, 2017, 158(Suppl 1):S74-S78.
- [3] Hans G, Deseure K, Robert D, et al. Neurosensory changes in a human model of endothelin-1 induced pain: A behavioral study [J]. *Neurosci Lett*, 2007, 418(2):117-1121.
- [4] Lam DK. Emerging factors in the progression of cancer-related pain [J]. *Pain Manag*, 2016, 6(5):487-496.
- [5] Quang PN, Schmidt BL. Endothelin-A receptor antagonism attenuates carcinoma-induced pain through opioids in mice [J]. *J Pain*, 2010, 11(7):663-671.
- [6] Connelly ST, Schmidt BL. Evaluation of pain in patients with oral squamous cell carcinoma [J]. *J Pain*, 2004, 5(9):505-510.
- [7] Schmidt BL, Pickering V, Liu S, et al. Peripheral endothelin A receptor antagonism attenuates carcinoma-induced pain [J]. *Eur J Pain*, 2007, 11(4):406-414.
- [8] Kopruszinski CM, Dos Reis RC, Gambeta E, et al. Blockade of endothelin receptors reduces tumor-induced ongoing pain and evoked hypersensitivity in a rat model of facial carcinoma induced pain [J]. *Eur J Pharmacol*, 2018, 818:132-140.
- [9] Yoneda T, Hiasa M, Nagata Y, et al. Contribution of acidic extracellular microenvironment of cancer-colonized bone to bone pain [J]. *Biochim Biophys Acta*, 2015, 1848(10 Pt B):2677-2684.
- [10] Omori M, Yokoyama M, Matsuoka Y, et al. Effects of selective spinal nerve ligation on acetic acid-induced nociceptive responses and ASIC3 immunoreactivity in the rat dorsal root ganglion [J]. *Brain Res*, 2008, 1219:26-31.
- [11] Qiu F, Wei X, Zhang S, et al. Increased expression of acid-sensing ion channel 3 within dorsal root ganglia in a rat model of bone cancer pain [J]. *Neuroreport*, 2014, 25(12):887-893.
- [12] Raoof R, Willemen H, Eijkelkamp N. Divergent roles of immune cells and their mediators in pain [J]. *Rheumatology (Oxford)*, 2018, 57(3):429-440.
- [13] Falk S, Dickenson AH. Pain and nociception: mechanisms of cancer-induced bone pain [J]. *J Clin Oncol*, 2014, 32(16):1647-1654.
- [14] Kane CM, Hoskin P, Bennett MI. Cancer induced bone pain [J]. *BMJ*, 2015, 350:h315.
- [15] Park SH, Eber MR, Widner DB, et al. Role of the bone microenvironment in the development of painful complications of skeletal metastases [J]. *Cancers (Basel)*, 2018, 10(5): 141.
- [16] Julius D, Basbaum AI. Molecular mechanisms of nociception [J]. *Nature*, 2001, 413(6852):203-210.
- [17] Gui Q, Xu C, Zhuang L, et al. A new rat model of bone cancer pain produced by rat breast cancer cells implantation of the shaft of femur at the third trochanter level [J]. *Cancer Biol Ther*, 2013, 14(2):193-199.
- [18] Liu S, Lv Y, Wan XX, et al. Hedgehog signaling contributes to bone cancer pain by regulating sensory neuron excitability in rats [J]. *Mol Pain*, 2018, 14:1744806918767560.
- [19] Bennett MI, Rayment C, Hjermstad M, et al. Prevalence and aetiology of neuropathic pain in cancer patients: a systematic review [J]. *Pain*, 2012, 153(2):359-365.
- [20] Brunelli C, Bennett MI, Kaasa S, et al. Classification of neuropathic pain in cancer patients: A Delphi expert survey

report and EAPC/IASP proposal of an algorithm for diagnostic criteria [J]. *Pain*,2014,155(12):2707-2713.

[21] Paice JA.Mechanisms and management of neuropathic pain in cancer [J]. *J Support Oncol*,2003,1(2):107-120. [22] Ossovskaya VS,Bunnett NW.Protease-activated receptors:Contribution to physiology and disease [J]. *Physiol Rev*,2004,84(2):579-621. [23] Amadesi S,Cottrell GS,Divino L,et al.Protease-activated receptor 2 sensitizes TRPV1 by protein kinase Cepsilon- and A-dependent mechanisms in rats and mice [J]. *J Physiol*,2006,575(Pt 2):555-571. [24] Kawasaki Y,Zhang L,Cheng JK,et al.Cytokine mechanisms of central sensitization:distinct and overlapping role of interleukin-1beta,interleukin-6,and tumor necrosis factor-alpha in regulating synaptic and neuronal activity in the superficial spinal cord [J]. *J Neurosci*,2008,28(20):5189-5194. [25] Tai LW,Pan Z,Sun L,et al.Suppression of Pax2 attenuates allodynia and hyperalgesia through ET-1-ETAR-NFAT5 signaling in a rat model of neuropathic pain [J]. *Neuroscience*,2018,384:139-151. [26] Matsuoka H,Nakamura K,Matsubara Y,et al.The influence of chemotherapy-induced peripheral neuropathy on quality of life of gynecologic cancer survivors [J]. *Int J Gynecol Cancer*,2018,28(7):1394-1402. [27] Lees JG,Makker PG,Tonkin RS,et al.Immune-mediated processes implicated in chemotherapy-induced peripheral neuropathy [J]. *Eur J Cancer*,2017, 73:22-29. [28] Kanat O,Ertas H,Caner B.Platinum-induced neurotoxicity:A review of possible mechanisms [J]. *World J Clin Oncol*,2017,8(4):329-335. [29] Cavaletti G,Ceresa C,Nicolini G,et al.Neuronal drug transporters in platinum drugs-induced peripheral neurotoxicity [J]. *Anticancer Res*,2014,34(1):483-486. [30] Gornstein EL,Schwarz TL.Neurotoxic mechanisms of paclitaxel are local to the distal axon and independent of transport defects [J]. *Exp Neurol*,2017,288:153-166. [31] Alessandri-Haber N,Dina OA,Joseph EK,et al.Interaction of transient receptor potential vanilloid 4,integrin,and SRC tyrosine kinase in mechanical hyperalgesia [J]. *J Neurosci*,2008,28(5):1046-1057. [32] Zhang H,Li Y,de Carvalho-Barbosa M,et al.Dorsal root ganglion infiltration by macrophages contributes to paclitaxel chemotherapy-induced peripheral neuropathy [J]. *J Pain*,2016,17(7):775-786. [33] Yang Y,Zhang YG,Lin GA,et al.Spinal changes of a newly isolated neuropeptide endomorphin-2 concomitant with vincristine-induced allodynia [J]. *PLoS One*,2014,9(2):e89583. [34] Chiba T,Oka Y,Sashida H,et al.Vincristine-induced peripheral neuropathic pain and expression of transient receptor potential vanilloid 1 in rat [J]. *J Pharmacol Sci*,2017,133(4):254-260. [35] Xie JD,Chen SR,Chen H,et al.Bortezomib induces neuropathic pain through protein kinase C-mediated activation of presynaptic NMDA receptors in the spinal cord [J]. *Neuropharmacology*,2017,123:477-487. [36] Manas A,Monroy JL,Ramos AA,et al.Prevalence of neuropathic pain in radiotherapy oncology units [J]. *Int J Radiat Oncol Biol Phys*,2011,81(2):511-520. [37] Delanian S,Lefaix JL,Pradat PF.Radiation-induced neuropathy in cancer survivors [J]. *Radiother Oncol*,2012,105(3):273-282. [38] Henriques de Figueiredo B,Huchet A,Dejean C,et al.Normal tissue tolerance to external beam radiation therapy:Peripheral nerves [J]. *Cancer Radiother*,2010,14(4-5):405-410. [39] Roth RS.Chronic postsurgical pain following breast reconstruction:a commentary and critique [J]. *Breast Cancer Res Treat*,2018,169(2):209-216. [40] Johansen A,Romundstad L,Nielsen CS,et al.Persistent postsurgical pain in a general population:Prevalence and predictors in the Tromso study [J]. *Pain*,2012,153(7):1390-1396.

备注/Memo: 上海市申康中心“促进市级医院临床技能与临床创新三年行动计划”项目(编号: 16CR4030A)

更新日期/Last Update: 1900-01-01