Effect of Topical Anesthetic Cream on Pain During Periareolar Injection of Technetium Tc99m Sulfur Colloid for Sentinel Lymph Node Biopsy in Breast Cancer: A Randomized Control Trial

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Abstract

Background: Injection of Tc99m to localize nodes for sentinel lymph node biopsy is reported by patients as very painful. The purpose of this study was to determine if anesthetic cream reduces pain associated with periareolar injection of Tc99m and to help elucidate conflicting literature regarding the efficacy of anesthetic cream for this procedure.

Methods: A randomized, double-blind, placebo-controlled methodology was used for adult females with breast cancer undergoing periareolar injection of Tc99m for sentinel lymph node biopsy. Pain levels were compared using anesthetic cream (2.5% lidocaine/2.5% prilocaine) vs. placebo. Patient exclusion criteria included use of opioids or adjuvant pain medication or injecting Tc99m the day before surgery. The Numerical Rating Scale was used to assess pain levels immediately after the injections.

Results: Comparing 23 experimental and 26 control patients, there was no significant difference between the experimental (median = 4) and the control group (median = 5) on level of pain experienced U=0.492, P > .05.

Conclusions: The experimental group had a slightly lower median pain score; however, there was no statistically significant difference between those who used the cream compared with those who used a placebo, supporting the conclusion that anesthetic cream does not reduce pain during Tc99m injections. This study adds to the current literature to provide a stronger position that there is no benefit to using anesthetic cream for this procedure.

References

[1] Lyman, G. H., Temin, S., & Edge, S. B., et al. (2014). Sentinel lymph node biopsy for patients with early-stage breast cancer: American Society of Clinical Oncology clinical practice guideline update. J Clin Oncol 32, 1365–1383.

[2] Armer, J., Fu, M. R., Wainstock, J. M., Zagar, E., & Jacobs, L. K. (2004). Lymphedema following breast cancer treatment, including sentinel lymph node biopsy. Lymphology 37, 73–91.

[3] Wetzig, N., Gill, P. G., & Espinoza, D., et al. (2016). Sentinel-lymphnode-based management or routine axillary clearance? Five-year outcomes of the RACS sentinel node biopsy versus axillary clearance (SNAC) 1 trial: assessment and incidence of true lymphedema. Ann Surg Oncol 1–7.

[4] Tsai, R. J., Dennis, L. K., Lynch, C. F., Snetselaar, L. G., Zamba, G. K., & Scott-Conner, C. (2009). The risk of developing arm lymphedema among breast cancer survivors: a meta-analysis of treatment factors. Ann Surg Oncol 16, 1959–1972.

[5] Zavagno, G., De Salvo, G. L., & Scalco, G., et al. (2008). A randomized clinical trial on sentinel lymph node biopsy versus axillary lymph node dissection in breast cancer: results of the Sentinella/GIVOM trial. Ann Surg 247, 207–213.

[6] Rodier, J. F., Velten, M., & Wilt, M., et al. (2007). Prospective multicentric randomized study comparing periareolar and peritumoral injection of radiotracer and blue dye for the detection of sentinel lymph node in breast sparing procedures: FRANSENODE trial. J Clin Oncol 25, 3664–3669.

[7] Krynyckyi, B. R., Kim, C. K., Goyenechea, M. R., Chan, P. T., Zhang, Z. Y., & Machac, J. (2004). Clinical breast lymphoscintigraphy: optimal techniques for performing studies, image atlas, and analysis of images. RadioGraphics 24, 121–145.

[8] O'Connor, J. M., Helmer, S. D., Osland, J. S., Cusick, T. E., & Tenofsky, P. L. (2011). Do topical anesthetics reduce periareolar injectional pain before sentinel lymph node biopsy? Am J Surg 202, 707–712.

[9] Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. Int J Social Res Methodol 8, 19–32.

[10] Fetzer, S., & Holmes, S. (2008). Relieving the pain of sentinel lymph node biopsy tracer injection. Clin J Oncol Nurs 12, 668–670.

[11] Crowe, J.B. & McCuaig, K. Pain associated with the injection of radioactive tracer for sentinel lymph node biopsy with and without use ofEMLA cream [abstract]. In ASCO's Breast Cancer Symposium 3rd annual meeting program: 2009 Oct 8-10.

[12] Hawkins, A. S., Yoo, D. C., Movson, J., Noto, R. B., Powers, K., & Baird, G. L. (2014). Administration of subcutaneous buffered lidocaine prior to breast lymphoscintigraphy reduces pain without decreasing lymph node visualization. J Nucl Med Technol 42, 260–264.

[13] Stojadinovic, A. C., Peoples, G. E., & Jurgens, J. S., et al. (2009). Standard versus pH-adjusted and lidocaine supplemented radiocolloid for patients undergoing sentinel-lymph-node mapping and biopsy for early

breast cancer (PASSION-P trial): a double-blind, randomised controlled
trial. Lancet Oncol 10, 849–854.
[14] Co, M., & Kwong, A. (2017). Preoperative sentinel node mapping in
sentinel node biopsy in early breast cancers - is it cost-effective? Clin Breast Cancer 17, 134–138.
[15] Gi_zewska, A., Witkowska-Patena, E., Osiecki, S., Mazurek, A., Stembrowicz-
Nowakowska, Z., & Dziuk, M. (2017). Utility of singlephoton emission tomography/computed tomography for sentinel lymph node localization in breast cancer patients. Nucl Med Commun 38, 493–
499.
[16] Layeeque, R., Kepple, J., & Henry-Tillman, R. S., et al. (2004). Intraoperative
subareolar radioisotope injection for immediate sentinel
lymph node biopsy. Ann Surg 239, 841–848.
[17] Thompson, M., Korourian, S., & Henry-Tillman, R., et al. (2008). Intraoperative
radioisotope injection for sentinel lymph node biopsy. Ann Surg Oncol 15, 3216–3221.
[18] Stell, V. H., Flippo-Morton, T. S., Norton, H. J.,&White, R. L. (2009).
Effect of intraoperative radiocolloid injection on sentinel lymph node biopsy
in patients with breast cancer. Ann Surg Oncol 16, 2300–2304.
[19] Vu, H. N., O'Connor, P. F., Shoemaker, R. R., Wan, W., Fratkin, M. J., & Bear, H. D. (2013). Intraoperative injection of radiocolloid
for sentinel node biopsy in breast cancer. J Nucl Med Technol 41, 1–5.
[20] Dambros Gabi, M. C., Masiero, P. R., Uchoa, D., Moraes, I. V., Biazus, J. V., & Edelweiss, M. I. (2014). Comparison between preoperative
and intraoperative injection of ^{99m}Tc Dextran-500 for sentinel lymph node localization in breast cancer. Am J Nucl Med Mol Imaging 6, 602–610.
[21] Sun, X., Liu, J., & Wang, Y., et al. (2010). Roles of preoperative lymphoscintigraphy
for sentinel lymph node biopsy in breast cancer patients. 40, 1932–1947.
48 S.
Jpn J Clin Oncol 40, 722–725.
[22] Mathew, M. A., Saha, A. K., Saleem, T., Saddozai, N., Hutchinson, I. F., & Nejim, A. (2010). Pre-operative lymphoscintigraphy
before sentinel lymph node biopsy for breast cancer. Breast 19, 28–32.
[23] Loveless, V. S., Surdock, C. P., & Bhattacharjee, H. (2010). Evaluation
of zeta-potential and particle size of technetium 99mTc-sulfur colloid subsequent to the addition of lidocaine and sodium bicarbonate. J Nucl Med Technol 38, 49–52.
[24] Borrelli, P., Donswijk, M. L., & Stokkel, M. P., et al. (2017). Contribution
of SPECT/CT for sentinel node localization in patients with ipsilateral breast cancer relapse. Eur J Nucl Med Mol Imaging 44, 630–637.
[25] Frusciante, V., Asabella,N.,&Castriotta,G., et al. (2016). Added value
of SPECT/CT over planar imaging in improving sentinel node detection
in breast cancer patients. Recenti Prog Med 107, 444–449.
[26] Vercellino, L., Ohnona, J., & Groheux, D., et al. (2014). Role of SPECT/CT in sentinel lymph node detection in patients with breast cancer. Clin Nucl Med 39, 431–436.
[27] McCaffery, M., & Beebe, A. (1989). Pain: Clinical Manual for Nursing
Practice. St. Louis: Mosby.
[28] Ferreira-Valente, M. A., Pais-Ribeiro, J. L., & Jensen, M. P. (2011).
Validity of four pain intensity rating scales. PAIN 152, 2399–2404.
[29] Williamson, A., & Hoggart, B. (2005). Pain: a review of three commonly used pain rating scales. J Clin Nurs 14, 798–804.
[30] Astrazeneca Canada Inc (2010). Product Monograph. Mississauga, Ontario.
Available at: https://www.astrazeneca.ca/content/dam/az-ca/downloads/
productinformation/EMLA%20-%20Product-Monograph.pdf.
[31] Giammarile, F., Alazraki, N., & Aarsvold, J. N., et al. (2013). The EANM and SNMMI practice guideline for lymphoscintigraphy and sentinel node localization in breast cancer. Eur J Nucl Med Mol Imaging



Biography:

Sarah Canning is a clinical nurse specialist and works with oncology patients in Ontario, Canada. She holds a MSc in Nursing and has a passion for breast cancer care. The voice of the patient inspired the completion of this research to make the patient experience better. Sarah has also conducted research in prostate cancer care, and has an advanced certificate in pain management from the University of Toronto. Disclaimer: The current abstract being submitted was published in *The Journal of Medical Imaging and Radiation Science 49 (2018) 44-48.*

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