Prevention of radial artery spasm during coronary angiography with transdermal glyceryl trinitrate patches: the NURSE-TTS trial

I. Doundoulakis¹, I. Kalamakidou², L. Koliastasis¹, M. Samara³, G. Papazisis⁴, D. Tsiachris⁵, K. Tsioufis¹, F. Economou²

¹National & Kapodistrian University of Athens, First Department of Cardiology, Athens, Greece; ²424 General Military Training Hospital, Cardiology, Thessaloniki, Greece; ³Aristotle University of Thessaloniki, 3rd Department of Psychiatry, Thessaloniki, Greece; ⁴Aristotle University of Thessaloniki, Department of Clinical Pharmacology, Thessaloniki, Greece; ⁵Athens Medical center, Athens Heart center, Athens, Greece

Funding Acknowledgement: Type of funding sources: None.

Background/Introduction: One of the most common complications encountered during transradial procedures is radial artery (RA) spasm, whereas its management remains a challenge.

Purpose: We hypothesized that in patients undergoing cardiac catheterization via the RA, the use of transdermal nitroglycerin (NTG) patches applied to skin over the RA puncture site may prevent the occurrence of radial artery spasm.

Methods: NURSE-TTS (Nitrate Use to Obtain Radial Spasm Embarrassment) is a parallel-group, randomized, double-blind, placebo-controlled trial evaluating the impact of transdermal NTG application to RA spasm prevention. 146 patients were consecutively enrolled from February 2021 to December 2021 from an experienced center in Greece and underwent diagnostic coronary angiography. The primary endpoint was the exerting force of the RA measured by the dynamometer in Newton.

Results: The primary endpoint of the dynamometer measurements was found to be significantly different between the two groups. The treatment group’s mean force was 5.95±2.60 and 7.21±2.82 for the placebo group respectively (p=0.007). The multivariate analysis confirmed that NTG patches affected radial spasm (treatment group p=0.010, 95% CI: −2.038, −0.282; age p=0.010, 95% CI: −0.099, −0.014; male gender p=0.011, 95% CI: −2.612, −0.349; CKD p=0.044, 95% CI: 0.064,0.951).

Conclusions: This is the first prospective randomized study demonstrating that the application of transdermal NTG 10mg on skin for 30 minutes before coronary angiography resulted in lower exerting force of the cannulated radial artery thus lower arterial spasm.