

PROCEEDINGS



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eP-32**Physiologic Effect of Caffeine on Susceptibility-Weighted Imaging**

Gonçalves Pereira, P.^{1,2}·Caseiro, A.²·Sousa, P.^{1,2}·Manaças, R.^{1,3}

¹HPP - Hospital dos Lusíadas, Lisboa, PORTUGAL,

²Instituto Politécnico de Lisboa, Escola Superior de Tecnologia da Saúde de Lisboa, Lisboa, PORTUGAL,

³Hospital dos Capuchos, Lisboa, PORTUGAL

PURPOSE

Susceptibility-weighted imaging (SWI) is a relatively new contrast in MR imaging. Previous studies have found an effect of caffeine in the contrast generated by SWI images. The present study investigates the effect of caffeine on contrast-to-noise ratio (CNR) in SWI

MATERIALS & METHODS

Twenty-four healthy volunteers (12 female, 26 - 54 ± 3 - 12 years) were enrolled in the study after being interviewed to exclude those with neurologic diseases. All participants gave their written informed consent. All the volunteers were caffeine-free for 24 hours prior to the test. After ingestion, there was no report of any undesirable side effect. Susceptibility-weighted images were acquired pre and postingestion of 100 ml of coffee (≈200 mg of caffeine). The volunteers were divided into four groups of six subjects and evaluated sequentially (15, 25, 30, 45 min after caffeine). High-resolution T2*-weighted 3D gradient-echo (SWI) sequence was acquired on the axial plane on a 1.5 T (Siemens Avanto) whole body scanner using the manufacturer's standard head coil and the parameters: TR=49; TE=40; flip-angle=15; FOV=87 x 230; matrix=221 x 320. The caffeine effect on SWI was quantified by calculating the contrast-to-noise ratio [CNR = (Sa - Sb)/Sref], in magnitude and MIP images, pre and postingestion of caffeine, whereas Sa corresponds to signal intensity measured by a ROI placed at the internal cerebral vein, Sb at the white matter of the corona radiata and Sref at the lateral ventricle (CSF). Image processing was performed using OsiriX. Statistics were performed with GraphPad Prism.

RESULTS

The SWI images postcaffeine showed an enhanced contrast in brain venous vasculature in all participants. Precaffeine CNR differed significantly from CNR measured postcaffeine in images of magnitude (p<0.0001) and MIP (p<0.0001). There was no difference between groups evaluated at different time-points postcaffeine.

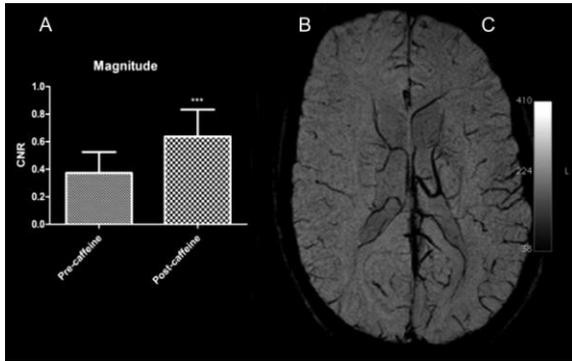


Figure: A - Mean and standard deviation of CNR pre and postingestion of ≈ 100 ml of coffee, (***,0.0001), obtained in internal cerebral vein for entire sample ($n = 24$) in magnitude images. B - Right hemisphere precaffeine (MIP image). C - Left hemisphere 15 min postcaffeine (MIP) with same window settings.

CONCLUSION

There was a significant reduction of signal within the veins in all the patients solely due to the effect of caffeine intake. Contrast differences pre and postcaffeine were not significant in white matter and in CSF. We speculate that caffeine can be used as a cost-effective, safe and easy way to administrate contrast agent on SWI images.

KEY WORDS: Susceptibility-weighted imaging, brain venous system, caffeine