

MRCP S PROSTO DOSTOPNIMI NEGATIVNIMI KONTRASTNIMI SREDSTVI

MRCP WITH THE USE OF OVER-THE-COUNTER NEGATIVE CONTRAST AGENTS

Teja Aškerc¹, Nejc Mekiš², Andrej Breznik¹

¹ Splošna Bolnišnica Celje, Radiološki oddelek, Oblakova ulica 5, 3000 Celje, 1000 Slovenija / General Hospital Celje, Department of Radiology, Oblakova ulica 5, 3000 Celje, 1000 Slovenia

² Univerza v Ljubljani, Zdravstvena fakulteta, Oddelek za radiološko tehnologijo, Zdravstvena pot 5, 1000 Ljubljana, Slovenija / University of Ljubljana, Faculty of health sciences, Medical Imaging and Radiotherapy Department, Zdravstvena pot 5, 1000 Ljubljana, Slovenia

Korespondenca / Corresponding author: askerc.teja@gmail.com

Prejeto/Received: 13. 10. 2019

Sprejeto/Accepted: 3. 3. 2022

IZVLEČEK

Uvod: Magnetno resonančna holangiopankreatografija (MRCP) je neinvazivna slikovna diagnostika, namenjena prikazovanju biliarnega trakta in pankreatičnih vodov. Alternativa dragim in slabo dostopnim suspenzijam superparamagnetnih delcev so sokovi, ki vsebujejo višje koncentracije mangana, kot so borovničev sok, ananasov sok, sok acai jagod in črni čaj.

Namen: Zanimalo nas je, ali obstaja razlika v kakovosti slike med nativno sliko in po zaužitju različnih negativnih kontrastnih sredstev, ter katero od področij PBT je najbolj vidno po uporabi negativnih kontrastnih sredstev.

Metode: V raziskavo smo vključili 20 zdravih prostovoljcev in prostovoljk. Slike smo primerjali z nativno sliko, ki je bila narejena isti dan kot slika z izbranim negativnim kontrastnim sredstvom. Preiskovanci so posamično zaužili tri različna negativna kontrastna sredstva (ananasov sok, borovničev sok in črni čaj). Med uporabo posamičnih kontrastnih sredstev je moralo preteči vsaj 24 ur. Nativni fazi je sledila druga faza z uporabo negativnega kontrastnega sredstva 10 minut po zaužitju le-tega. Slike sta ocenila dva izkušena radiologa, ki sta na slikah ocenjevala kakovost slik po zaužitju negativnega kontrastnega sredstva.

Rezultati in razprava: Ugotovili smo, da se pri uporabi vseh vrst negativnih kontrastnih sredstev nakazuje podoben trend vidljivosti anatomskih struktur. Najboljše rezultate oz. kakovost slik smo dosegli z uporabo ananasovega soka. Ugotovili smo statistično značilne razlike v kakovosti izničenja signala iz želodca, dvanajstnika, trebušne slinavke, žolčnih vodov in papile Vateri. Pri uporabi črnega čaja nismo ugotovili statistično značilnih razlik.

Zaključek: Na slikah, ki so nastale po zaužitju ananasovega ali borovničevega soka, je v primerjavi z nativno sliko bolj jasno vidno, da je učinkovito in signal iz želodca, dvanajstnika ter proksimalnega dela črevesja zasičen. Črni čaj je dobil najslabše ocene, ker se nobena od opazovanih anatomskih struktur na sliki po zaužitju kontrastnega sredstva ni videla boljše.

Gljučne besede: MRCP, negativno kontrastno sredstvo, ananasov sok, borovničev sok, črni čaj, vizualizacija

ABSTRACT

Introduction: Magnetic resonance cholangiopancreatography (MRCP) is a non-invasive MR examination technique that provides us with information about the anatomy and pathology of the bile ducts. Alternatives to expensive negative contrast agents are over-the-counter beverages that contain higher concentrations of manganese, such as blueberry juice, pineapple juice, and black tea.

Purpose: To investigate whether the use of negative over-the-counter contrast agents improves the quality of MRCP examination, which of them provide better visualization of the pancreato-biliary tract (PBT), and in which areas of the PBT the greatest differences are seen.

Methods: Measurements were performed on 20 healthy volunteers. We started with »native« imaging of the PBT area, and at least 24-hour intervals, the volunteers ingested three different negative contrast agents such as pineapple juice, blueberry juice, and black tea. The examinations were repeated 10 minutes after ingestion of the contrast agents. Images were evaluated by two experienced radiologists who assessed the improvement in visualization after contrast ingestion.

Results: A comparison between pineapple juice and blueberry juice showed that there were no statistically significant differences between them, but pineapple juice had an insignificantly higher score compared with all anatomic structures. We found a statistically significant difference in signal suppression in the stomach, duodenum, pancreatic duct, common bile duct, and papillae Vateri after ingestion of pineapple juice and blueberry juice. Statistical analysis showed no significant differences after the consumption of black tea.

Discussion and Conclusion: We found that pineapple juice and blueberry juice were both equally suitable for performing MRCP examination, as they best suppressed the signal from the gastrointestinal tract and allowed better visualization of the PBT, whereas black tea proved to be an ineffective negative contrast agent.

Keywords: MRCP, negative contrast media, pineapple juice, blueberry juice, black tea, visualization

LITERATURA / REFERENCES

- Arrivé L, Coudray C, Azizi L et al. (2007). Pineapple juice as a negative oral contrast agent in magnetic resonance cholangiopancreatography. *J Radiol* 88(11):1689-94.
- Bittman ME, Callahan MJ (2014). The effective use of acai juice, blueberry juice and pineapple juice as negative contrast agents for magnetic resonance cholangiopancreatography in children. *Pediatr Radiol* 44(7): 883-7. doi: 10.1007/s00247-014-2884-5.
- Bequet AY, Fatmasari D, Masrochah S, Santoso AG, Latifah L (2018). Utilization of dates extract to suppress stomach and duodenal signal on magnetic resonance cholangiopancreatography (MRCP). *IJAMSCR* 6(3): 671-5.
- Coppens E, Metens T, Winant C, Matos C (2005). Pineapple juice labeled with gadolinium: a convenient oral contrast for magnetic resonance cholangiopancreatography. *Eur Radiol* 15(10): 2122-9.
- Dajčman D (2008). Avtoimunski pankreatitis- prikaz primera. *Zdrav Vestn* 12(1): 15-21.
- Duarte JA, Furtado AP, Marroni CA (2012). Use of pineapple juice with gadopentetate dimeglumine as a negative oral contrast for magnetic resonance cholangiopancreatography: a multicentric study. *Abdom Imaging* 37(3): 447-56. doi: 10.1007/s00261-011-9761-6.
- Fatimah AS, Suwondo A, Sugiyanto IR, Rajiani (2018). Oolong tea drink as an alternative to oral negative contrast media in magnetic resonance cholangio pancreatography (MRCP). *Indian Journal of Public Health Research & Development* 9(9): 224-8.
- Ghanaati H, Rokni-Yazdi H, Jalali AH, Abahashemi F, Shakiba M, Firouznia K (2011). Improvement of MR cholangiopancreatography (MRCP) images after black tea consumption. *Eur Radiol* 21(12): 2551-7. doi: 10.1007/s00330-011-2217-0.
- Govindarajan A, Lakshmanan PM, Sarawagi R, Prabhakaran V (2014). Evaluation of date syrup as an oral negative contrast agent for MRCP. *AJR* 203(5):1001-5.
- Griffin N, Edwards GC, Grant LA (2012). Magnetic Resonance cholangiopancreatography: the ABC of MRCP. *Insights Imaging* 3(1):11-21.
- Hiraishi K, Narabayashi I, Fujita O et al. (1995). Blueberry juice: Preliminary evaluation as an oral contrast agent in gastrointestinal MR imaging. *Radiology* 194: 119-23.
- Papanikolaou N, Karantanas A, Maris T, Gourtsoyiannis N (2000). MR cholangiopancreatography before and after oral blueberry juice administration. *J Comput Assist Tomogr* 24(2):229-34.
- Popovič P, Kržan M, Štabuc M, Garbajs M (2017). MR holangiopankreatografija z uporabo sekretina. *Gastroenterolog* 21(1): 57-61.
- Riordan RD (2004). Pineapple juice as a negative oral contrast agent in magnetic resonance cholangiopancreatography: a preliminary evaluation. *Br J Radiol* 77: 991-99.
- Siemens Healthineers, (2020). <https://www.siemens-healthineers.com/magnetic-resonance-imaging/options-and-upgrades/coils/body-18/features>
- Tang HH, Song B, Huang ZR, Yao H (2013). Application of black tea as a negative oral contrast in magnetic resonance cholangiopancreatography (MRCP). *Sichuan Da Xue Xue Bao Yi Xue Ban* 44(3):476-80.