

DOLOČANJE KALCIJEVEGA BREMENA V KORONARNIH ARTERIJAH: CT PROTOKOLI

DETERMINATION OF CALCIUM LOAD IN CORONARY ARTERIES: CT PROTOCOLS

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IZVLEČEK

Uvod in namen: Ocene kalcijevega bremena v koronarnih arterijah, pridobljene s CT slikanjem, so se izkazale za prognostične pri oceni tveganja za razvoj bolezni srca in ožilja pri asimptomatskih posameznikih. Protokoli za slikanje kalcinacij v koronarnih arterijah se razlikujejo. Za oceno kalcijevega bremena se najpogosteje uporablja Agatstonovo točkovanje. Naš namen je predstavitev različnih protokolov CT slikanja, kjer se upošteva faktorje pacienta in CT aparata. Z izbiro primerne CT protokola se optimizirata kvaliteta CT slik in doza na pacienta.

Metode: Za pisanje prispevka smo uporabili opisno metodo zbiranja podatkov. Literaturo smo pridobivali iz podatkovnih zbirk, kot so Google učenjak, Cobiss+, PubMed in ScienceDirect. Časovni okvir iskanja literature je bil nastavljen od leta 2005 do 2024.

Rezultati: Rezultati pregleda literature kažejo, da lahko z optimizacijo CT protokola slikanja dosežemo do 20-krat nižjo dozo sevanja na pacienta. Koronarne arterije se premikajo glede na srčni utrip. Pri visokem srčnem utripu ne moremo prikazati vseh hkrati v istem območju srčnega utripa. Izbira protokola je odvisna od vrste in zmogljivosti CT aparata ter od srčnega utripa pacienta. Optimizirane protokole je mogoče implementirati na CT aparate različnih proizvajalcev.

Razprava in zaključek: Optimalno sestavljen CT protokol za slikanje koronarnih arterij za oceno kalcijevega bremena je ključnega pomena za oceno tveganja za nastanek srčnega infarkta. V Sloveniji je umrljivost zaradi bolezni srca in ožilja na tretjem mestu. Zaradi nizke doze sevanja in velike povedne vrednosti bi bila lahko metoda ocenjevanja kalcijevega bremena pri rizičnih, asimptomatskih posameznikih presejalna metoda.

Ključne besede: kalcijevo breme, CT protokol, optimizacija, doza

ABSTRACT

Introduction and purpose: Estimates of coronary artery calcium load, obtained by CT imaging, have been shown to be prognostic in assessing the risk of developing cardiovascular disease in asymptomatic individuals. Imaging protocols for coronary artery calcifications vary. Agatston scoring is the most commonly used method to assess calcium load. Our aim was to present different CT imaging protocols, where patient and CT scanner factors are taken into account. By choosing a suitable CT protocol, the quality of CT images and the patient dose are optimized.

Methods: We used the descriptive method of data collection to write the paper. Literature was obtained from databases such as Google Scholar, Cobiss+, PubMed and ScienceDirect. The timeframe of the literature search was set from 2005 to 2024.

Results: The results of the literature review showed that by optimizing the imaging protocol, we can achieve up to 20x lower patient dose. Coronary arteries move according to the heart rate. At a high heart rate, we cannot show them all at the same time in the same heart rate zone. The choice of protocol depends on the type and efficiency of the CT scanner, and on the heart rate of the patient. Optimized protocols can be implemented on CT devices from different vendors.

Discussion and conclusion: An optimally constructed CT protocol for coronary artery imaging to assess calcium load is crucial for the assessment of myocardial infarction risk. In Slovenia, mortality due to cardiovascular diseases ranks third. Due to its low radiation dose and high predictive value, the calcium load estimation method in at-risk, asymptomatic individuals could be a screening method.

Keywords: calcium load, CT protocol, optimization, dose

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