



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

radiographers and radiologists. In-depth interviews were also conducted with nine experts in the radiology field.

Results: The knowledge, attitude, and practice scores among radiologists and medical radiographers regarding the radiation protection measures were 63% (moderate), 70% (neutral), and 54% (poor), respectively. Training courses had a significant effect on the level of knowledge regarding radiation protection measures ($p = 0.015$). Participants working at the pediatric hospitals had better knowledge than those working in the general hospitals ($p = 0.013$). Participants with previous training had better attitudes than those who had not undertaken training; however, the difference was not statistically significant ($t = 1.80, p = 0.077$).

Conclusion: There is a need for continuous training programmes in radiation protection measures. Physicians, medical radiographers, and radiologists should be provided with written criteria, protocols, and guidelines which should be adopted for all pediatric referrals to imaging.

Implications for practice: Consideration should be given to applying pediatric radiation protection measures routinely.

Abstract 8

METAL ARTIFACT REDUCTION AND ITERATIVE RECONSTRUCTION ALGORITHMS IN COMPUTED TOMOGRAPHY IMAGING OF HIP PROSTHESES

A. Omarah¹, M. Hjouj¹, M. Aljama², F. Hjouj³

¹Department of Medical Imaging, Al-Quds University, Jerusalem, Palestine;

²Department of Medical Imaging, Arab American University, Jenin, Palestine; ³Department of Mathematics, Khalifa University, Abu Dhabi, United Arab Emirates

Introduction: Computed tomography (CT) of metal hip prostheses are prone to experiencing metal-related artefacts during the imaging process. The resulting low image quality can affect the surrounding tissue and the metal implant itself which can lead to the loss of relevant findings. Various techniques have been used to reduce metal artifacts, which can improve the image quality by minimising their origin.

Methods: A multi-modal image were acquired using different kilovoltage peak (kVp) settings and reconstructed with different algorithms: filtered back projection (FBP), iterative reconstruction (iDose4), iterative model-based reconstruction (IMR), and orthopaedic metal artefact reduction (O-MAR). The image quality criteria were noise, signal to noise ratio (SNR), and CT number.

Results: The IMR approach significantly improved the image quality when compared to iDose4 and FBP ($p < 0.05$). O-MAR combined with IMR had good impact in CT accuracy, noise reduction, and SNR improvement. O-MAR decreased the appearance of metal artefacts and was most efficient in severe artefacts when used in combination with 140 kVp and IMR.

Conclusion: Using IMR combined with O-MAR can improve the quality of images of a total hip prostheses by minimising metal artefacts and reducing noise.

Implications for practice: Artefact-reduction algorithms have a good impact on increasing the image quality, diagnostic value, and treatment planning, and reducing the risk of misinterpretation in patients with hip implants and metal fixation hardware.

Abstract 9

RATIONAL USE OF MAGNETIC RESONANCE IMAGING FOR LUMBAR SPINE IN GAZA STRIP

R. Al Aroqi¹, M. Abuqamer², H. Mansour²

¹Al Quds Hospital, Gaza, Palestine; ²Department of Medical Imaging, Al-Azhar University, Gaza, Palestine

Introduction: Low back pain (LBP) is a common health problem among adults. The majority of patients with LBP are classified as non-specific, which means there is no need to refer for a magnetic resonance imaging (MRI) scan. This study aimed to assess the use of lumbar spine MRI in the Gaza Strip and the factors affecting it.

Methods: A cross-sectional analytical study was conducted on 200 patients at Gaza Strip hospitals suffering from LBP. A mixed method approach,

including both quantitative and qualitative data, a questionnaire, and eight key informant interviews, were the tools for data collection.

Results: About 41.0% (82 of 200) of participants had non-justified MRIs, while 59% (118 of 200) had justified examinations. There were many factors that were statistically significant with the rational use of lumbar spine MRI, such as patients' sociodemographic factors (gender, age; $p = 0.043$ and $p < 0.001$, respectively). For example, about 48.9 % of the MRI examinations of male patients were not justified, while in female patients the percent was 34.0%. The highest unjustified rate was seen in patients under thirty years of age at 72.0%, in contrast to patients over sixty years of age who had the lowest unjustified rate at 12.9%.

Conclusion: Before referring to MRI, explicit guidelines and criteria should be applied and followed. Further physician training is needed to minimise unjustified MRI examinations.

Implications for practice: Collaborative efforts should be applied to reduce the number of unjustified requests and improve the rational for MRI utilisation.

Abstract 10

SEVERE CHEST IMAGING FINDINGS OF CORONAVIRUS DISEASE FROM MARCH TO NOVEMBER 2020 IN PALESTINE

S. Mansour¹, M. Sada¹, S. Smerat², S. Abuteir¹, S. Alsaify¹, A. Abueisa¹, A. Sublaban¹, M. Abu Samra³, M. Awies¹

¹Department of Medical Imaging, Al-Quds University, Palestine;

²Department of Medical Imaging, Istishari Arab Hospital, Palestine; ³Icahn School of Medicine at Mount Sinai, New York, USA

Introduction: Due to the rising number of Coronavirus disease 2019 (COVID-19) cases, the role of chest radiography and chest computed tomography (CT) scans has been essential for rapid diagnosis. The purpose of this study was to provide a thorough analysis of imaging manifestations of patients infected with severe COVID-19.

Methods: Through the picture archiving and communications system (PACS) a total of 131 chest radiographs (CXR) and high-resolution chest CT (HRCT) scans were collected from five Palestinian governmental hospitals from March to November 2020. IBM SPSS Statistical Software Version 23 was used for analysis.

Results: 131 patients were included in this study; 67 (51.1%) were female while 64 (49.9%) were male. The sample population had a mean age of 60 years ranging from 17 to 90 years of age. The most frequently occurring severe COVID-19 findings on HRCT were: ground glass opacity (GGO), interlobular septal thickening, air bronchogram, and pulmonary consolidations. The most common findings on CXR were: GGO, consolidation, and reticular interstitial thickening. Patients 60 years of age and older showed significantly increased incidence of atypical CT findings such as lymphadenopathy and reversed halo sign. A significant relationship between the age of the patients and COVID-19 findings was evident ($p = 0.012$).

Conclusion: CT and CXR play pivotal roles in diagnosis and monitoring the progression of COVID-19. Familiarity with predominant COVID-19 findings assists in early detection and management.

Implications for practice: Consideration should be given that radiologists and radiographers become familiar with the imaging patterns of COVID-19 for better diagnosis and treatment; therefore, enhancing the capabilities of healthcare systems worldwide.

Abstract 11

THE ASSOCIATION BETWEEN CHANGES IN CORONARY ARTERY CALCIUM SCORES, DIETARY INTAKE, PHYSICAL ACTIVITY, AND DEPRESSION SYMPTOMS AMONG THE POPULATION OF GAZA STRIP, PALESTINE

A. Beram¹, K. Zinszer², S. Abuzerr^{3,4}, K. Jabre⁵, H. Gharbia⁵, A. Hamid el Bilbeisi⁶, A. Ubeid⁵, W. Jawula Salisu⁷

¹Prince Naeif Centre for Radiodiagnostics, Ministry of Health, Gaza, Palestine;

²School of Public Health, University of Montreal, Montréal, Canada;

³Department of Social and Preventive Medicine, University of Montreal, Montréal, Canada; ⁴Quality Improvement and Infection Control Unit,

Ministry of Health, Gaza, Palestine; ⁵Department of Radiology, Al-Shifa