

PROVA ORALE N. I

Il candidato descriva il protocollo di studio angio-TC per una sospetta tromboembolia polmonare, con particolare riferimento alla gestione del paziente in urgenza, alla tecnica di sincronizzazione tramite bolus tracking e alle ricostruzioni post-processing finalizzate ad una corretta valutazione diagnostica.

PROVA NON ESTRATTA

ARMANDO VITUCCI 24-07-2026

PROVA ORALE N. 2

Il candidato descriva le tecniche angiografiche utilizzate in risonanza magnetica illustrandone caratteristiche principali, indicazioni cliniche, vantaggi e limiti.

PROVA ESTRATTA

ARMANDO VITUCCI 24-07-2026

PROVA ORALE N. 3

Il candidato descriva l'approccio tecnico e relazionale del TSRM nell'esecuzione di un esame di Risonanza Magnetica encefalo basale in età pediatrica.

PROVA NON ESTRATTA

ARMANDO VITUCCI 24.07.2026



Review article

Unveiling the future: Advancements in MRI imaging for neurodegenerative disorders

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ARTICLE INFO

Keywords:

Magnetic Resonance Imaging
Neurodegenerative Disorders
Molecular Imaging
Alzheimer's Disease
Brain Tumor

ABSTRACT

Neurodegenerative disorders represent a significant and growing global health challenge, necessitating continuous advancements in diagnostic tools for accurate and early detection. This work explores the recent progress in Magnetic Resonance Imaging (MRI) techniques and their application in the realm of neurodegenerative disorders. The introductory section provides a comprehensive overview of the study's background, significance, and objectives. Recognizing the current challenges associated with conventional MRI, the manuscript delves into advanced imaging techniques such as high-resolution structural imaging (HR-MRI), functional MRI (fMRI), diffusion tensor imaging (DTI), and positron emission tomography-MRI (PET-MRI) fusion. Each technique is critically examined regarding its potential to address theranostic limitations and contribute to a more nuanced understanding of the underlying pathology. A substantial portion of the work is dedicated to exploring the applications of advanced MRI in specific neurodegenerative disorders, including Parkinson's disease, Alzheimer's disease, Huntington's disease, and Amyotrophic Lateral Sclerosis (ALS). In addressing the future landscape, the manuscript examines technological advances, including the integration of machine learning and artificial intelligence in neuroimaging. The conclusion summarizes key findings, outlines implications for future research, and underscores the importance of these advancements in reshaping our understanding and approach to neurodegenerative disorders.

1. Introduction

Neurodegenerative disorders pose a formidable challenge to global healthcare systems, representing a diverse group of conditions characterized by progressive degeneration of the morphology and functionality of the nervous system. It stands as the primary contributor to both physical and cognitive disability on a global scale, impacting roughly 15% of the worldwide population (Van Schependom and D'haeseleer, 2023). The number of affected individuals has notably risen in the last three decades. Furthermore, the load imposed by persistent neurodegenerative ailments is anticipated to undergo at least a twofold increase in the coming two decades (Hou et al., 2019).

Conditions such as Parkinson's disease, Alzheimer's disease, Huntington's disease, and Amyotrophic Lateral Sclerosis (ALS) lead to the gradual loss of neurons, resulting in cognitive decline, motor

dysfunction, and, ultimately, severe disability (Pathak et al., 2022). The implications of neurodegenerative disorders are profound, impacting not only the affected individuals but also their families, caregivers, and society at large. The economic burden of these disorders is substantial, stemming from the costs associated with long-term care, medical interventions, and lost productivity (Hazard et al., 2009). Moreover, the emotional toll on patients and their support networks is immeasurable as individuals grapple with gradually eroding their independence and identity. The increasing prevalence of these disorders among aging populations worldwide further underscores the urgency of developing effective interventions (Egede, 2007).

Particularly, advancements in medical research and technology in neuroimaging, such as Magnetic Resonance Imaging (MRI), offer hope for early detection and targeted treatments (Hanif et al., 2021; Risacher and Saykin, 2013; Wintermark et al., 2018). MRI is often combined with

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<https://doi.org/10.1016/j.arr.2024.102230>

Received 11 January 2024; Received in revised form 11 February 2024; Accepted 11 February 2024

Available online 15 February 2024

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QUESITO DI INFORMATICA

Il candidato illustri cos'è Microsoft Excel e quali sono le sue principali funzioni.