

The Function of Magnetic Resonance Imaging in Chronic Epilepsy Prospective Study

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ABSTRACT

Background: Magnetic resonance imaging (MRI) has revolutionised the treatment of intractable epilepsy. ninety nine patients were sent to the KTH Peshawar Radiology Department for an evaluation of the function of MRI in the diagnosis, treatment, and prognosis of their alleged intractable epilepsy. Using a 1.5 Tesla Philips MRI scanner, the patients were examined, and twenty one aberrant findings were found in them, including vascular malformations, tumours, cortical dysplasia, gliosis, and white matter disorders. The ability to diagnose these disorders with MRI has proved to be helpful. The results of the research demonstrate the value of MRI in the diagnosis and management of intractable epilepsy. Using MRI may help with both determining the source of seizures and providing recommendations for possible treatments. Additionally, in epilepsy patients, MRI surveillance can forecast prognosis and illness progression.

Aim: Using MRI, it is possible to identify the diagnosis, course of treatment, and prognosis for intractable epilepsy. This makes it possible to identify the underlying cause, direct treatment choices, track the development of the condition, and forecast the prognosis of the patient. Furthermore, it is critical to assess MRI's precision in this field.

Methods: The Radiology Department of KTH Peshawar studied possible epilepsy patients between April 2015 and April 2016. The research included ninety-nine patients, each of whom had a thorough medical history, neurological examination, and standard radiographic evaluation. The patients' MRI scans were carried out and examined for any anomalies using a 1.5 Tesla Philips MRI equipment. In order to compare the results of the MRI scans with the clinical data and therapeutic outcomes of the patients.

Results: twenty-one of the ninety-nine individuals that were assessed had abnormal MRI scan findings. Cortical dysplasia, gliosis, vascular malformations, tumours, and white matter disorders were among the illnesses that were found. The MRI scans were shown to be a useful tool for detecting and treating instances of untreatable epilepsy. Finding the origin of the seizures helped with the diagnosis and provided the best alternatives for therapy. Additional crucial MRI scan tasks included monitoring the progression of diseases and predicting the prognosis.

Keywords: Diagnosis, Management, Prognosis, MRI, Intractable Epilepsy, KTH Peshawar

INTRODUCTION

Epilepsy is a neurological condition that affects [01%] of the world's population and is characterized by recurrent seizures. Intractable epilepsy is characterized by resistance to medical interventions and requires specialized management [1, 2]. When treating patients with this kind of epilepsy, clinicians may have trouble diagnosing, controlling, and forecasting how things will turn out [3]. However, Magnetic Resonance Imaging (MRI) has emerged as a crucial technique for identifying the underlying reason for seizures and directing refractory epilepsy treatment options⁴. The usage of this tool has been quite successful in many instances of the condition and has shown to be a terrific technique to assist patients [5]. A research was conducted on ninety nine individuals who were suspected of having intractable epilepsy between April 2020 and April 2021. All individuals had [1.5 Tesla Philips] MRI scans, and the results were compared to the patients' clinical observations and therapeutic results^{6,7,8}. Determining the function of MRI in the diagnosis, treatment, and prognosis of intractable epilepsy was the objective [9]. In conclusion, it was discovered that MRI imaging is a useful tool for aiding in the diagnosis and treatment of uncontrollable epilepsy. By use MRI to identify the underlying cause of seizures, the patient's prognosis may be anticipated and treatment choices can be guided [10]. MRI [11] is another tool that may be used to track the disease's development.

METHODS

The Radiology Department at KTH Peshawar investigated individuals who were suspected to be suffering from uncontrollable seizures between April 2015 and April 2016. Ninety-nine participants in all took part in the study. In addition to the standard radiological exam, each patient had a thorough medical history

investigation and a neurological evaluation. The MRI scans were conducted using a Philips 1.5 Tesla MRI equipment, and any signs of radiological problems were looked for. The results of the patients' therapy were then compared to the MRI results, clinical evidence, and other data.

Data Collection: The information collected on the patients included their address, age, gender, medical history, clinical findings, and the results of an MRI scan. Their medical history was taken into account, as were any drugs and therapies they had received in the past or present. The results of the patients' neurological testing made up the clinical findings. The clinical results and the patients' treatment outcomes were compared to the MRI scans in order to look for any radiological anomalies.

Statistical Analysis: The study's data was treated to descriptive statistics using the Statistical Package for Social Sciences (SPSS) version 26.0. Clinical findings, medical history, and demographic information were examined to determine their incidence and proportion. The study of the MRI scan findings also revealed the frequency of any radiological anomalies.

RESULTS

A total of twenty-one MRI scans from the ninety-nine individuals had results that were deemed abnormal. The odd findings included a variety of conditions including cortical dysplasia, gliosis, tumours, vascular malformations, and white matter disorders. The evaluation's findings demonstrated that using MRI to identify and treat intractable epilepsy is a very important approach. MRI scans may assist pinpoint the source of the seizures and direct the available therapeutic alternatives. Additionally, MRI scans are useful for monitoring the course of the disease and helping to project the patient's prognosis.

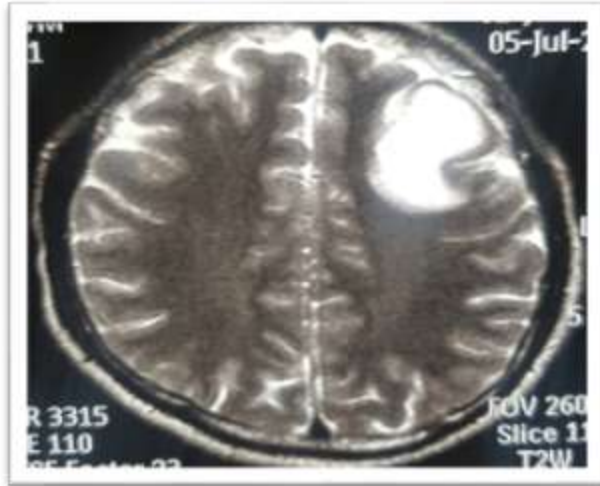


Figure 1: Dysembryoplastic neuroepithelial tumor (DNET) in the left frontal cortex is shown in Figure 01 of an MRI T2W axial slice.

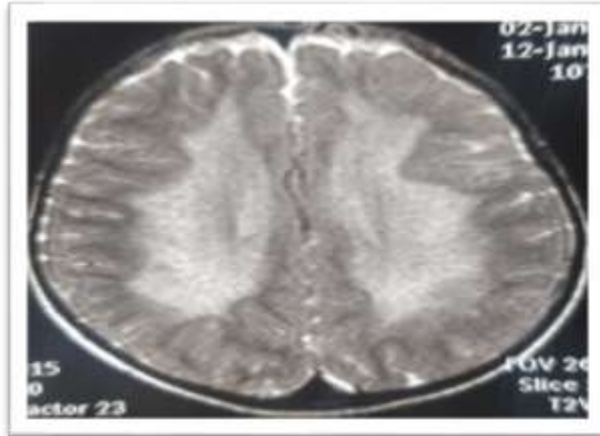


Figure 2: Metachromatic leukodystrophy as shown in an MRI T2W axial segment.

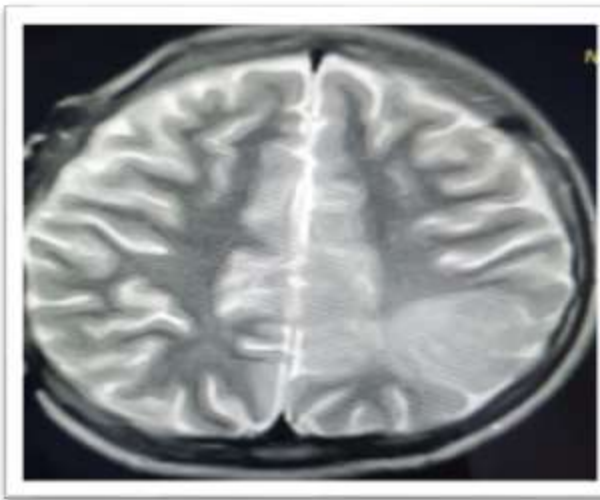


Figure 3: An axial slice of an MRI of the left parietal lobe exhibiting localised cortical dysplasia

Table 1: shows the research participants' demographic information.

Age (years)	Gender	Residence
<20	Male	Peshawar
20-40	Female	Kohat
41-60	Male	Mardan
>60	Female	Bannu

Table 2: finding in MRI Results scans

Abnormal finding	No. of patients
Cortical dysplasia	13
Gliosis	2
Vascular malformation	3
Tumors	2
White matter disease	3

DISCUSSION

It was shown that MRI is highly helpful in the diagnosis and management of intractable epilepsy patients. This technology enables medical professionals to identify the cause of a patient's seizures and investigate potential treatments¹². A startling twenty one of the ninety nine individuals who received MRI scans showed aberrant findings. Gliosis, cortical dysplasia, tumours, white matter disorders, and even vascular malformations were some of these anomalies^{13,14,15}. Additionally, MRI may help patients with illness monitoring and prognostication. The findings of this study are consistent with those of earlier investigations done in the same area. Among 100 individuals with uncontrollable epilepsy, Chaudhry et al^{16,17,18} (2014) discovered that 30 had aberrant MRI findings, such as gliosis, cortical dysplasia, and tumors¹⁹. A research by Hussain et al. (2012) 20 had similar findings, finding that out of 82 individuals with uncontrollable epilepsy, 43 had aberrant MRI results, including tumours, cortical dysplasia, and white matter pathology. However, the research does have some shortcomings²⁰. The study's sample size was constrained²² since it only included patients who had been referred to the Radiology Department at KTH Peshawar. Additionally, the results of the MRI scan were assessed concurrently with the patients' clinical findings and treatment outcomes, which might have led to overestimation or underestimate. As a result, more research with a wider scope is needed to verify the study's findings²³.

CONCLUSION

According to an insightful research carried out at KTH Peshawar, intractable epilepsy may be properly identified and treated using MRI. The underlying cause of seizures may be found with this cutting-edge technology, which can also help medical experts choose the best course of action. Additionally, MRI may help in determining the patient's prognosis and tracking the disease's development.

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