

Nursing Capstone Project

Name

Institution

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Part 1-Development of the PICOT Question

After a series of research and studies, it is evident that multiple cases of minor head injuries and subsequent intracranial hemorrhages in head injury went undiagnosed hence untreated. A majority of the health care institutions were using X-ray computed tomography commonly

referred to as CT scans. Due to the ~~increased rates of the minor head injuries and subsequent~~ ~~cases of intracranial hemorrhages in children, there was increased the number of patients being~~ ~~admitted to the institution's trauma emergency department. Similarly, the number of child deaths~~ ~~due to head injuries is relatively high resulting in increasingly high rate of mortality and~~ ~~morbidity. My proposed focuses on identifying the limitations of using CT scans over other~~ ~~existing methods of diagnosing head injuries. Evaluation of hospital documents and records~~ ~~indicated that there were chances that CT scans failed~~ identifying minor head injuries whether

inflicted or non-inflicted. In this proposal, the study will be rooted in a Diagnosis Clinical question using the following PICOT question:

PICOT: Among victims of minor head injuries (P) does use of MRI and DTI (I) compared to contemporary scanning methods (C) improve timely diagnosis of minor head injuries (O)?

Problem Observation Settings

The problem of misdiagnosed and untimely late diagnosis of minor head injuries that can result in intracranial hemorrhages (ICH) is a challenge to many hospitals that provide tertiary and tertiary services. In the case of traumatic brain, most head injuries go unnoticed or undiagnosed. A lot of people sustain minor head injuries that do not pose any significant health problem at first. The injuries later lead to the development of ICH increasing the populations' mortality and morbidity rate because of untimely diagnosis of the minor injuries.

Problem Description

Diagnosis and treatment of minor head injuries in children pose some challenges to health care providers. Head injuries, particularly intracranial hemorrhages (ICH), are difficult and subtle to notice and. Therefore, it is common for available monitoring techniques to show little or no evidence of the anticipated injury. Without proper diagnosis and subsequent treatment, the injuries can advance to concussions.

Currently, the available imaging techniques do not fully address the problem we have at hand. A CT Scan is the most common method of identifying minor head injuries. However, the efficiency and effectiveness of these techniques are not in congruence with what is expected of them in

the medical arena. With your diagnosis and treatment of minor head injuries victims, the role of technology in this age has not been working. My project will come up with reasonable procedures and technologies to address the problem. The outcome of the project will be entirely based on empirical data obtained from the qualitative and descriptive research I conducted regarding the problem in question. By using MRI's as the intervention tool, I will be able to prove that technology due to technological knowledge can be achieved by adopting the new and sophisticated technologies. Results from Functional Magnetic Resonance Imaging (fMRI) and Diffuse Tensor Imaging (DTI) for four months will be compared with those from the previous diagnostic procedures.

Impact of the Problem

If the minor head injury is not treated, the concussions will cause disruption of normal functioning of the brain just as any other physical body injury does. Retrospective studies indicate that chances of TBI occurring in children are 1.4% to 4%. About 41% of children experience head injuries during the first week of delivery, and the condition is highly related to traumatic deliveries. Statistics indicate that 20% of victims with the condition die within the week for timely diagnosis and subsequent treatment. Data from CDC indicates that

children with inhibitors and below the age of ten have a significant chance of developing ICH sometime later in their life.

Solution Description

According to Roquski et al. (2015), MRI is highly recommended as an alternative to CT. It can be used to diagnose Traumatic Head Injury (THI) and intracranial hemorrhage. A study was conducted to evaluate **how sensitive MRI was to head injury compared with head injuries that had been missed by the X-ray computed tomography. By focusing on the review of all the patients who underwent both CT and MRI over a period of 5 days, a sample group of 25 patients with the total was obtained. MRI scan results of the 25 patients were studied. Reports reviewed the images for the presence of traumatic head injuries, intracranial hemorrhages, and skull injuries. Results indicate that CT scan had** recorded 14 negative results for minor head injuries that were clearly imaged when the MRI scan was used.

The implication of these results further confirms the necessity of adopting new diagnostic imaging methods. Ultrasound imaging and MRIs are considered as the best alternatives to CT scans. Ultrasound uses sound to **generate images while MRI uses magnetic fields to do the same. Unlike the two, CT scan uses beams of X-rays. Children require that continuous and prolonged exposure to these magnetic fields can lead to cancer. Although these findings have never been substantiated scientifically, it is worth noting and appreciating such possibility.**

~~According to a medical journal also indicates that multiple~~ exposures to the scan procedures increased chances of developing brain tumors and leukemia.

Part 3: Critical Appraisal Peer Reviewed Journals

According to Cooper et al. (2000), inflicted Traumatic Brain Injury (TBI) is considered the second biggest cause of death in infants after TBI. To ascertain this, Gibbs (2010) research findings indicated that the ~~number of radiologists of head injuries, particularly in the brain, is very common. Evidence confirming cases of radiologists using ordinary CT scans indicated the need for health care professionals to adopt effective diagnostic methods. Bailey et al. (2012) determined how efficient MRI scans were when used to diagnose head injuries via a study was conducted on 98 children to be in the study, all the infants had no known history. However, they presented with symptoms that were nonspecific in nature. CT scans coded out. 6.4% of the infants were identified having other head injuries. Thomas et al. (2013) noted that one of the children was recruited having TBI. 61.5% of the other health injury cases were self-inflicted but had been untreated. Thermal was non-inflicted. When the test was conducted using Magnetic Resonance Imaging (MRI), the results were different. 18% of the children were diagnosed with Inflicted Brain Injury. The two tests are clinically accepted as an imaging solution, but they presented contrasting results (Dunkley, 2012). All the children fell under the 0 to 2 year age~~

lesions. The results indicated that X-ray computed tomography was not efficient in diagnosing minor head injuries that were inflicted long ago. An online database journal by Strassman (2016) on CT and MRI recommendations supplement indicated that CT scan is mostly recommended when the head injury occurred between 24 hours to 48 hours. In the case of MRI, a positive

diagnosis is not limited by time span implying that it is better suited for minor head injuries that have gone for a long time undiagnosed. Strand et al. (2015) study on MRI application recommended the diagnostic procedure in minor head injuries /brain traumas.

According to Gibbs et al. (2015), MRI is highly recommended as an alternative to CT. It can be used to diagnose Traumatic Head Injury (THI) and intracranial hemorrhage. A study was conducted to evaluate how sensitive MRI was to head when undiagnosed minor head injuries

that had been missed by the X-ray computed tomography. Carlson et al. (2015) results were based on a two-year study of 574 admissions to level 1 trauma center. By focusing on the review of all the patients who underwent both CT and MRI over a period of 3 days, a sample group of 25 patients with the total was obtained (Chen, 2014). MRI scans results of the 25 patients were recalled. Reports for the presence of traumatic head injuries, intracranial hemorrhages, and skull injuries reviewed the images. Grubb's year-reviewed journal (2016) found that CT scan had

recorded 14 negative results for minor head injuries that were clearly imaged when the MRI scan was used.

The implication of these results further confirms the necessity of adopting new diagnostic imaging methods (Huang, 2013). Ultrasound imaging and MRIs are considered as the best alternatives to CT scans (Larkin et al. 2013). Ultrasound was found to be a better imaging while MRI was superior to both to do the same. Unlike the rest, CT scan was known of X-rays. Munkittrick et al. 2013 says that continuous and prolonged exposure to these magnetic fields can lead to cancer. According to a medical journal, The Marshall's Journal (2013) when head injury radiographs by CT scan can lead to repeated scan over a short period. Munkittrick's et al. (2014) Journal also indicates that multiple exposure to the scan procedures increased chances of developing brain tumors and leukemia. Another study in 2013 by Rodrigo et al. (2014) suggested that 43% of those cancer cases can be prevented if 25% of the highest doses were reduced.

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