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Usefulness of X-Rays in the Evaluation of Patients with Pains of the Upper Limb

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Abstract

The conventional use of x-rays in radiodiagnosis is widely obtainable in Nigeria. This study was intended, therefore to determine the usefulness of x-rays to evaluate pains of the upper-limb in aspects of its contribution to diagnosis, cost, patient care and management and the views for detailed information. Adopting judgemental sampling, a non-probability sampling, approach was used. A total of two hundred and forty seven (247) radiographs were handpicked using the request forms and radiologist reports on the radiographs. The results obtained showed that the use of x-rays to evaluate pain of the upper limb contributed 47.70% to therapeutic decision, cost, patient care and management. Oblique view had a positive outcome of 51.50% as against posterior anterior and lateral views which had 27.14% and 22.16% respectively. In comparison, computed tomography (CT) scans of 72 patients showed that 68.06% of the cases were diagnosed as pain resulting trauma, spondylosis, ostemomyelitis and narrowing of disc spaces. The CT scan result showed an improvement over conventional x-ray and an added advantage to therapeutic decision making and patient care/management. It was concluded that the use of other imaging modalities in our hospitals should supplement the use of conventional x-rays on pains of the upper limb to remove doubt on therapeutic decisions in our health institutions.

INTRODUCTION

The human body consists of numerous tissues and organs that are diverse in structure and function. Yet they function together, and in harmony, for the well being of the body as a whole. The overwhelming role in co-ordinating the activities of the body rests with the nervous system[1]. The nervous system is composed of two parts, the central nervous system (CNS) and the peripheral nervous system (PNS) [2-3]. In comparison to other organs and systems of the body, the nervous system has several unique and anatomic and physiologic characteristics, the protective bony enclosure of the skull and spinal column that contains it, and as specialized system. Due to these special characteristics, the nervous system is vulnerable to unique pathologic processes [4-5]. The upper limb disorder is a term covering all sorts of conditions causing pains or discomfort in the hands, arms and shoulders [6]. Upper limb disorders vary in kind and severity, therefore, it is necessary to have proper diagnostic method which will aid physicians in the management and treatment of patients presenting with them. Today, the advent of Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) compliments the use of x-rays in the diagnosis of patients with upper limb disorders [6].

In Nigeria, there is limited availability of CT and MRI. Hence, we have x-ray equipments, which are less expensive and readily available for the examination of the upper limb. It is against this background that this study is geared towards the investigation of the usefulness of x-rays examinations in the effective management and evaluation of patients with pains of the upper limb.

MATERIALS AND METHOD

The value of conventional x-ray examination in the evaluation of patients with pains of the upper limb was assessed by a non-experimental case study design.

A total of two hundred and forty seven (247) radiographs from two centers A and B were used. The criteria for selecting the radiographs included those which queried pain of the upper limb; radiographs with good contrast and well demonstrated structures as well as radiographs with an accompanying radiologists report. The aspects of the evaluation considered in this study include: contribution to diagnosis, views for detailed information, cost-effectiveness and patient care/management.

On the basis of this satisfactory validation, the data reflect adequately the issues investigated to minimum distortion by subjective factors. There is also therefore an acceptable reliability. Measurements were taken based on Clark [7].

Also, the percentage result of the patients with pains of the upper limb was compared side by side with the percentage result of the contribution of Computed Tomography (CT) scan to patients with similar history.

RESULTS

A total of two hundred forty seven (247) radiographs of the upper limb x-ray of patients suspected with pains critically examined. The contribution of x-ray examination to patients with pains of the upper limb in the areas of diagnosis, cost effectiveness, patient care and general management is 47.7% for positive outcome (Table I). The oblique view with 51.50% positive outcome prove a better view as against posterior anterior and lateral views with 27.1% and 22.2% respectively (Table 2). The contribution of CT scan to the diagnosis of pain of the upper limb from studying 72 subjects was 68.1% (Table 2).

DISCUSSION

The study proposition was to evaluate the value of x-ray of the upper limb for pain. The normal sensory function is the product of an actively maintained equilibrium between the neurons and their environment; and disruption of this equilibrium that results from changes in sensitivity, excitability, transmission, growth status and survival can initiate profound changes in sensory function which explains why diverse diseases can manifest as pain[7].

The study revealed that the contribution of the use of x-rays to the evaluation of pains of the upper limb to diagnosis, cost, patient care and general management was 47.7%. This figure appeared below the half mark. The oblique views with 51.5% positive outcome showed a better view over posterior anterior view and lateral view in demonstrating the nerve roots. This is in consonance with the theory by Clark [8].

The contribution of CT to the same criteria showed a positive outcome of 68.1% contribution to the diagnosis of pains of the upper limb. This gave better contrast devoid of overlying shadows and structures [9]. Although, the conventional use of x-rays contributed less to the cost of patient care than any other diagnostic study, 47.7%, it had little effect on diagnostic decision when compared to CT 68.1%. These results revealed that the conventional use of x-ray examination to evaluate patients with pains of the upper limb is not so much effective and efficient in this time and age when medical technology is advancing especially in neuroradiology [10-11].

In conclusion, provision of modern imaging modalities in our hospitals to supplement the conventional use of x-rays would ensure better decision making in assessment of pains of the upper limb. It is however hoped that this development will not lead to a significant increase in the financial burden of the patients.

Table 1: Contribution of x-rays to examination of pains of the upper limb.

Area of interest	Positive	Negative
Contribution to diagnosis	118	129
Cost effectiveness	118	129
Patient care and management	118	129
Frequency (%)	47.70	52.30

Table 2: Views for x-ray examination of pains of the upper limb and Computed Tomography (CT) scan

Views	Number	Frequency (%)
Oblique	60	51.50
Antero-posterior	31	27.14
Lateral	27	22.16
CT scan	49	68.06

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