



## Pattern of X-Ray Findings at 563 Nigeria Airforce Hospital, Jos

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### ABSTRACT

This study aimed at investigating various conditions and findings on X-rays. X-ray is an electromagnetic wave that is used in evaluating patients with different disease condition. X-ray of patients that presented to the radiology department between June 2015 and June 2016 were evaluated for the study. Demographic data, indications and findings were evaluated. The result shows, that there was a total of 368 subjects. Females (50.5%) were more than males in the study. Hypertension constituted the predominant indication for X-ray, this accounted for 87 subjects (23.6%), followed by medical fitness, 74 subjects (20.1%). Over 50% of the findings were normal, followed by lumbar spondylosis and then hypertension. In conclusion, more than half of the participants had normal findings. Lumbar spondylosis and hypertension were the most frequent indications and findings.

**Keywords:** Findings, Hospital, Indications, X-ray

### INTRODUCTION

X-ray can be defined as an electromagnetic wave of high energy and very short wavelength, which is able to pass through many materials opaque to light.<sup>1</sup> X-rays were discovered in Europe on 8<sup>th</sup> November, 1895 by a German physicist, Wilhelm Comrad Roentgen in his laboratory at polytechnic institute Zurich, Germany. The end product of the radiographic process in the production of a "dark film" radiograph of high diagnostic value. X-ray films exposed to transmitted x-radiation from anatomical parts under examination has imprinted on them latent images of structures traversed. This latent

image is made visible by chemical or digital processing. Several applications of x-rays include engineering, archeology, industries, airport-security, astronomy, biotechnology, and medicine.<sup>2</sup> In medicine, x-rays are used for treatment of malignant growths and for diagnosis of various disease conditions such as Osteoarthritis, Hypertension, Pneumonia, fractures, dislocation etc.<sup>3</sup> The World Health Organization's (WHO) International Agency for Research on Cancer and the US government have classified x-rays as carcinogens. Bremer *et al.*, estimated that 0.4% of current

cancers in the US are due to CT scan performed in the past and may increase to as high as 1.5% to 2.0% with 2007 rate of CT or x-ray usage. Military hospitals are instituted to cater for injured soldiers, military personnel and their dependents. The primary clientele of 563 NAF Hospital, Jos include the military schools- Air Force Military School (AFMs) and Air Force Girls Comprehensive School (AFGCS), residents within the barrack community as well as the retirees that are resident within the metropolis. This study therefore presents the pattern of x-ray findings at 563 NAF hospital Jos between June 2015 to June 2016 in relation to age groups, sex distribution and the medical conditions.

### Aim and Objectives of the Study

The main aim of this study was to assess the pattern of disease conditions in relation to the ages and sexes of the respondents in NAF Hospital, Jos.

### Objectives

To assess the disease distribution by age, sex and type of medical conditions seen at 563 NAF Hospital Jos. To determine the common medical conditions seen in the center and to contribute research-based relevant data that will assist in rational decision making.

### Significance of the study

Number of patients accessing x-ray services in military hospital seems to be on the rise, notwithstanding the dwindling allocation. Data on predominant disease conditions generating requests for x-ray from the physicians, age and sex of the patients is currently unavailable in this center. Results from this study will provide relevant information for effective allocation of scarce resources as well as policy formulation and decision making by the hospital.

### Scope of the study

Statistical analysis of data obtained from x-ray request forms and radiologist report findings between June 2015 and June 2016, form the scope of the study.

## MATERIALS AND METHODS

### Study area

The study was carried out in NAFH, a secondary healthcare facility located in the city of Jos, Jos South LGA of Plateau State in North-Central Nigeria. Study Design: This was a cross-sectional study of all patients that accessed health care

at 563 NAFH and had x-ray services.

### Data Collection

Age and sex of the patients that had x-ray investigation were obtained from the request forms. Frequency of all medical indications for x-ray were collated. Results of the x-ray findings were also obtained from the radiologist reports at 563 NAF Hospital Jos.

### Inclusion Criteria

All patients that had x-ray investigations.

### Data Analysis

Data were analyzed using SPSS version 23, results obtained were reported in form of frequency tables and bar charts.

## RESULTS

**Table 1: Age Distribution of the Respondents**

Age	Frequency	Percent
<10 yrs	14	3.8
10 -19 yrs	60	16.3
20 - 29 yrs	41	11.1
30-39 yrs	43	11.7
40 -49 yrs	104	28.3
50-59 yrs	49	13.3
>50 yrs	57	15.5
N	368	100

Respondents within the 40 -49 years age group had the highest frequency while those within the <10 yrs-age group had the least frequency

**Table 2: Sex Distribution of Respondents**

Sex	Frequency	Percent
Female	186	50.5
Male	182	49.5
n	368	100

With regards to gender, there were more females than males in the distribution of x-ray requests in this hospital.(Table 2)

The most common indication for x-ray was hypertension, while the least common were pre-surgery evaluation and retroviral cases.

**Table 3: Distribution of Indications for X- Ray.**

Medical Indications	Frequency	Percent
Medical fitness	74	20.1
Chest pain	24	6.5
Suspected fracture	22	6.0
Lower back pain	56	15.2
Hypertension	87	23.6
Post trauma	4	1.1
Chest infection	50	13.6
Joint pain	7	1.9
Neck pain	14	3.8
Pre surgery evaluation	2	0.5
Post obstructive airway disease	21	5.7
Heart failure	5	1.4
Retroviral disease	2	0.5
N	368	100

**DISCUSSION**

From the results, the respondents between ages 40-49 constituted the majority of respondents in which x-ray was indicated. This could be due to increase in disease conditions with onset within this age distribution. Conditions like hypertension and lower back pain, which in this study are the first and third most common indications, have their age of onset from 40years and above.<sup>5,6</sup> In Nigeria, a study done by Ernest et al showed an increased prevalence of hypertension with advancing age.<sup>9</sup>

There were more females than males in our study. This is in keeping with the study done by Lahelma *et al.*, in Finland.<sup>7</sup> Their study produced evidence that the magnitude of gender difference in ill-health was relatively small. Also, Ashley *et al.*, in Canada, confirmed that women have greater health seeking behavior than men for both physical and mental health concerns. This study also shows that out of the 368 respondents, 204(58%) had a normal study report which is the highest frequency. This could be due to the higher pre-school and routine medical examinations requests. Adeko *et al.*, in their study done in Nigeria found that 95.2% of employees in the center had normal chest radiographic reports during a pre-employment examination.<sup>11</sup> Some medical conditions may show normal plain radiographic findings at some stages of the disease; this may also have played out in our study.

Literature indicates that spondylosis has been used in several contexts, and often synonymously with arthrosis, spondylitis and osteoarthritis. It has also been considered as the hypertrophic response of adjacent vertebral bone to disc degeneration.<sup>12,13</sup> Lumbar spondylosis was reported in 39 (10.6%) and it is seen to affect respondents within the age distribution of 40years and above. Studies in the United States recognized that more than 80% of individuals older than 40 years have lumbar spondylosis.<sup>6</sup> Large studies of osteoarthritis have long recognized the aging process to be the strongest risk factor for bony degeneration, particularly within the spine.<sup>12</sup> However, there is no statistically significant association between the age and x-ray result. The occupation of the studied population could also contribute to the findings of lumbar spondylosis. Retrospective studies cite Body Mass Index (BMI), incident back trauma, daily spine loading (twisting,

**Table 4: Distribution of Conditions (Result) Based on their X Ray reports**

Result	Frequency	Percent
Normal study	204	55.4
Lumbar spondylosis	39	10.6
Hypertensive heart disease	17	4.6
Hypertension	38	10.3
Muscle spasm	30	8.2
Chest infection	17	4.6
Rib fracture	2	0.5
Cervical spondylosis	10	2.7
Broncho pneumonia	3	0.8
Constipation	1	0.3
Congenital anomaly of the rib	1	0.3
Malignant body lesion	1	0.3
Osteoarthritis	1	0.3
Avascular necrosis of femoral head	1	0.3
Mandibular fracture	1	0.3
Soft tissue injury	2	0.5
N	368	100

The results of the x-ray revealed that majority were normal study, followed by lumbar spondylosis. Indications with the least frequency include mandibular fracture, avascular necrosis and malignant body lesion.

lifting, bending, and sustained non-neutral postures), and whole body vibration (such as vehicular driving) to be factors which increase both the likelihood and severity of spondylosis.<sup>14,15</sup>

In this study, hypertension constituted the most frequent indication for x-ray request, and it accounted for the second highest medical condition on x-ray report. This could be related to the age of the respondents where most of the respondents fall within the higher age bracket in which hypertension is most prevalent.<sup>5</sup> The need to assess target organ damage which is important in the evaluation of a hypertensive patient, as it provides important information on the severity of the hypertension and the cardiovascular risk assessment,<sup>6</sup> could explain why the request for radiographs for respondents with hypertension is high. However, hypertension guidelines do not recommend chest radiographs in the routine evaluation of hypertensive patients.

Muscle spasm was also common, accounting for 30 (8.2%). This could be occupation related knowing that most of the respondents were military personnel involved with much physical activities. Chest infections were among the most common infections encountered in out-patient and in-patient clinical care here; chest infection accounted for 4.6% of all the X-rays done. In this study, Hypertensive heart disease accounted for 4.6%. Ekpe *et al.*, found that Hypertensive heart disease is the predominant acquired heart disease, which is not surprising as it is the reflection of the prevalence of systemic hypertension in Nigeria.<sup>18</sup> According to WHO's Global status report on Non-communicable diseases 2010, the WHO African region, within which Nigeria is located, has the highest prevalence of hypertension among adults, estimated at 45%.<sup>17</sup>

Cervical spondylosis is a chronic degenerative condition of the cervical spine, and it accounted for 2.7% in our study, which is seen more in the middle aged than the elderly. This is in keeping with the study done by Wang *et al.*, which shows a decreasing proportion of cervical spondylosis with aging in the elderly, while the proportion of cervical spondylosis increases with aging in the young and the adult population.<sup>19</sup>

## CONCLUSION

There were more normal findings. This was followed by lumbar spondylosis and hypertension respectively.

## Conflict of interest

None declared.

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