1 *Original Research Article*

2 TITLE:

3 **Radiologic pattern of sputum-positive Pulmonary Tuberculosis**

4 **(PTB) among immunocompetent patients in Gwagwalada, Nigeria.**

5 **ABSTRACT**

6 **Background:** The radiologic knowledge of tuberculosis-associated lung disease is an essential tool in the clinical

7 diagnosis of tuberculosis, a disease that is still a big challenge to Nigeria and Africa at large. **Objective:** To

8 determine the radiologic pattern of sputum-positive PTB among immunocompetent patients in Gwagwalada, Nigeria.

9 **Methods:** A cross-sectional study involving one hundred adult patients recently clinically diagnosed of pulmonary

10 Tuberculosis were recruited and underwent chest radiographic examination with 14 × 17-inch or 17 × 17-inch image

11 sizes for evaluation of pulmonary Tuberculosis. **Results:** Of the 100 patients that underwent chest radiographs, ten

12 patients (10.0%) had normal chest radiographs while varying degree of abnormal chest radiographic findings were

13 seen in the remaining 90 (90%) patients. Fibrosis lesion were present in 45 (45.0%) of patients. There were 60 male

14 and 40 female patients but eight of the normal chests radiographic were males. Fibrosis was the predominant

15 radiological feature with 45 (45.0%) of all the patients examined in this study. The prevalence of other findings was:

16 addconsolidation, 11 (11.0%); lung collapse, (11.0%); cavitation, (11.0%); pleura effusion, (7.0%) and lung infilterate,

17 (5.0%). Multiple lung cavities were not observed in any patient nor were military features. Cavitary lesions were

18 present in 11 (11.0%) and all the cavitary lesions were solitary and were present in the upper lung zone(s).

19 **Conclusion**: Pulmonary tuberculosis is still very much with us, although emphasis are placed more on

20 immunocompromise patients, evaluation of radiology features in immunocompetent individual is encouraged in

21 developing countries. Fibrosis on chest radiogram is an essential feature in pulmonary tuberculosis.

22 **Key Words**: Pulmonary tuberculosis, chest radiogram, Radiologist, Gwagwalada, Abuja.

23 **INTRODUCTION**

24 Tuberculosis, more than any other infectious disease, has always been a challenge, since it has been responsible for

25 a great amount of morbidity and mortality in humans1. The large and rapidly growing numbers of patients with

26 Tuberculosis in Africa is a source of concern. Intra- and inter- country conflicts, immigration crisis and poverty are

27   responsible for the re-emergence of diseases. Diagnostic technique ranges from clinical, laboratory and radiologic

28   methods. Coordinated programs and integration of TB management is a key strategy that will improve the diagnosis,

29   treatment, and outcome for patients with Tuberculosis1,2.

30   The radiologic knowledge diagnosis/assessment of tuberculosis-associated lung disease is an essential tool in the clinical diagnosis of

31   tuberculosis2. Chest radiography is the primary imaging method, but the importance of CT is still increasing, as CT is

32   more sensitive in the detection of cavitation, of hilar and mediastinal lymphadenopathie, of endobronchial spread and

33   of complications in the course of the disease. Chest radiography is simple, cheap and readily accessible to patients in

34   resource poor countries. Chest radiography provides essential information for the management and follow up of

35   these patients and is extremely valuable for monitoring complications3,4

36   The most important denominator with regards to presentation is the immune status of the patient with antecedent

37   change in the epidemiology of the disease. This change in the epidemiological picture has several causes, of which

38   the AIDS epidemic, the progression of   poverty in developing countries, arm conflicts and the emergence of

39   multidrug-resistant tuberculosis are the   most likely suspects. Mainly due to this epidemiological change, the

40   radiological patterns of the disease are also being altered, not conforming to the classical distinction between primary

41   and post primary disease pattern and atypical presentations in groups with an altered immune response being

42   increasingly reported. Therefore the morphologic spectrum of tuberculosis clinico-radiologic is quite variable but early

43   diagnosis of tuberculosis is essential to achieve an efficient therapeutic outcome and to prevent further spread of the

44   disease4,5,6.

45   The global impact of TB is extremely important, considering that an estimated 9.0 million people developed TB in

46   2013 and 1.5 million died from the disease, according to the recent World Health Organization (WHO) global

47   tuberculosis report 2014. At radiology, primary PTB manifests as four main entities – parenchymal disease,

48   lymphadenopathy, pleural effusion, and miliary disease – or any combination thereof. Multilobar consolidation can be

49   seen in almost 25% of cases calcified in up to 15% and in post primary, Cavitation, the radiological hallmark of PTB,

50   is radiographically evident in 20–45% of patients. A pleural effusion is seen in approximately one-fourth of patients

51   with primary PTB and in 18% of post-primary PTB 7,8,9. The cost of treatment keeps increasing which includes the

52   treatment of the disease and its complications9,10,11,12. This study set out to evaluate the importance of chest

53   radiographic in the diagnosis and monitoring of patients with sputum positive *Mycobacterium tuberculosis* infection in resource poor

54   setting.

55 **Aim**

56 The aim of the study was to determine the radiologic pattern of sputum-positive PTB among immunocompetent

57 patients in Gwagwalada, Nigeria.

58 **METHODOLOGY**

59 **Study background**

60 This was a cross – sectional study involving one hundred (100) subjects, conducted at the Department of Radiology,

61 University of Abuja Teaching Hospital, Gwagwalada, Abuja, Federal Capital Territory (F.C.T), Nigeria.

62 **Study population**

63 Consecutive adult patients recently clinically diagnosed of pulmonary Tuberculosis were recruited and underwent

64 chest radiographic examination for evaluation of pulmonary Tuberculosis.

65 **INCLUSION CRITERIA:**

66 i. Sputum/ alveolar lavage/gastric positivity via acid-alcohol fast bacilli using Ziehl neelsen stain (ZN)

67 ii. HIV seronegative patients

68 iii. Acid alcohol fast bacilli positive.

69 iv. No prior history of active tuberculosis.

70 **EXCLUSION CRITERIA:**

71 i. Patient that discontents to be part of the study.

72 ii. Extrapulmonary tuberculosis.

73 iii. Pregnant women.

74 iv. Patient with other concommited immunosuppressive disorders.

75 **Radiogram**

76 The subjects received formal chest radiographic examinations with imaging parameters of 14 × 17-inch or 17 × 17-

77 inch image sizes; maximum tube currents of 650 mA; usual exposure amount of 1 or 2 mAs; tube voltage of 100-120