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Five-year trend of smear positive pulmonary tuberculosis in Kano, Nigeria

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ABSTRACT: *Background* - The tuberculosis epidemics in Africa is on the rise even in low HIV-prevalence settings¹. In Nigeria the burden of TB is not precisely known, but the steady rise in notifications since 1995 and the relatively high case rate among young adults probably reflect a real increase in real incidence associated with HIV and strong continuing transmission². Our aims and objectives are to review the trend of smear positive (SS+) Pulmonary Tuberculosis (PTB) in Kano and to determine the prevalence of smear positive (SS+) PTB.

Method - This is a retrospective study of 5 years from 2001 to 2005. These involved 11,748 patients who were suspected of clinical Pulmonary Tuberculosis based on clinical presentation and chest X-rays. Sputum smear was prepared in each case with a new slide, allowed to dry, fixed and stained using the Ziehl Nelson (ZN) Technique. A total of 11,748 patients had 3 sputa samples examined during this 5 year period.

Results - A total of 11,748 patients had their sputa examined comprising of 8331 males and 3417 females. Nine hundred and sixty one were smear positive (SS+) - 8.2%. There was a steady rise in trend of SS+ from 2001 to 2004 with a decline in 2005. The number of ordered tests also showed a steady rise from 2001 up to the 2005.

Conclusion - Pulmonary tuberculosis is still prevalent in Kano and there is continuous rise in patients turn over for screening which is a good indicator for achieving control of this epidemic. Although there was a continuous rise in the trend of SS+ PTB, the overall prevalence of 8.2% is low compared to other findings in Nigeria and other countries especially in Africa.

Key Words: Pulmonary tuberculosis; Epidemiology; Retrospective study; Kano; Nigeria.

Introduction

The Pulmonary Tuberculosis (PTB) epidemics in Africa is on the rise even in low HIV-prevalence settings¹. In Nigeria the burden of PTB is not precisely known, but the steady rise in notifications since 1995 and the relatively high case rate among young adults probably reflect a real increase in real incidence associated with HIV and strong continuing transmission².

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Tuberculosis causes approximately two million deaths per year globally³. Ninety eight percent (98%) occur in low-income countries ⁴. In Africa in contrast to many other parts of the world, the incidence rate is rising by approximately 6% per year⁵. Nigeria has the world's fourth largest TB burden with nearly 374,000 estimated new cases annually².Thirty three thousands seven hundreds and fifty five (57%) of the new TB cases were smear positive (SS+) cases. Total notified cases of all TB forms increased from 46,473 in 2003 to 59,493 in 2004. At the end of 2005 66,848 cases of TB had been identified, of which only 52% were SS+². The public health burden posed by PTB is becoming increasingly important as the country's HIV/AIDS burden unfolds. Who estimated that 27% of Nigeria's TB patients are HIV positive. Other African countries with relatively low level of HIV prevalence also show rising TB notification. In Kano many studies have been carried out by different workers in which they looked at various aspects of PTB alone or in relation to other diseases such as HIV/AIDS. In this study, we are reviewing all the sputa smear results seen in the last five years at the Kano teaching hospital. We also looked at the prevalence of smear positive PTB seen over the five years.

Methods

Patients were referred from all the Departments within and outside the hospital for AFB sputum smear. The Ziehl Neelsen staining technique was used. Samples were taken as three consecutive overnight sputum specimens or the new recommended WHO standard as on the spot sample, overnight sample and again on the spot sample. In either regimen 3 specimen is mandatory and is defined as smear positive (SS+) if he has + to ++ in at least one of the three specimens. Their HIV serostatus was not considered.

Results

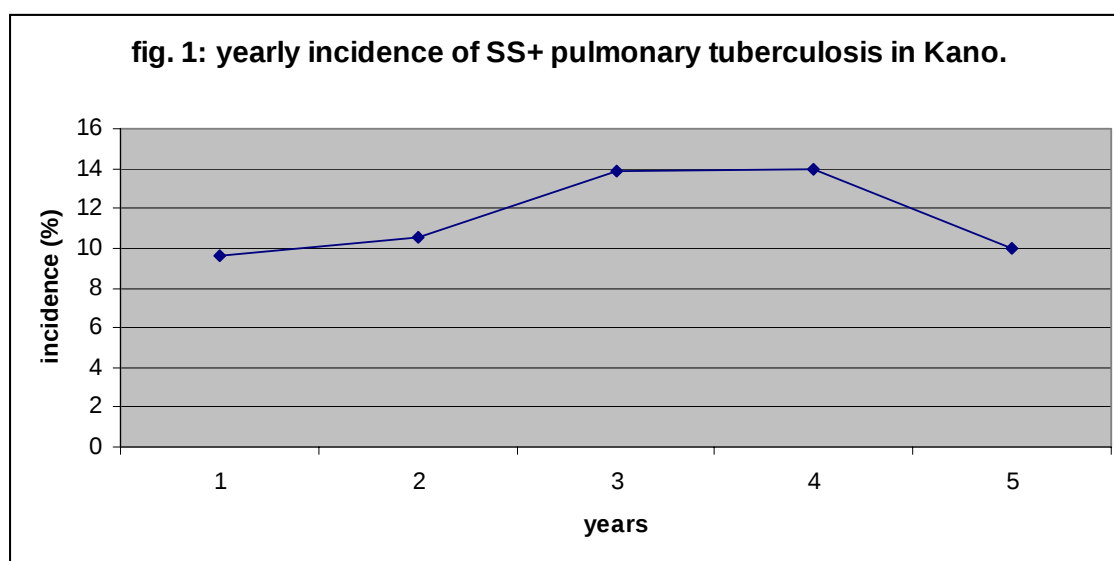
Eleven thousand seven hundred and forty eight patients were screened from 2001 to 2005. Eight thousands three hundreds and thirty one (70.9%) were males while 3417 (29.1%) were females. Table 1 shows the yearly distribution of ordered tests and the proportions of SS+ among the examined patients while table 2 shows the gender distribution of the screened patients.

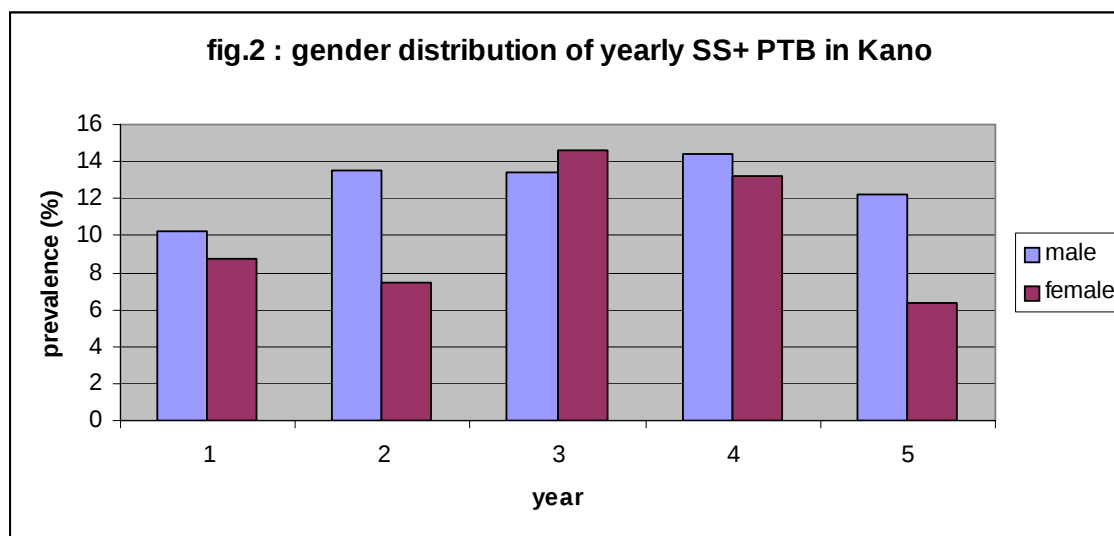
Table 1: Five-year Trend of Smear Positive Pulmonary Tuberculosis in Kano.

Years	Total No tested	Percentage positive (%)
2001	1338	129 (9.6)
2002	1340	140 (10.5)
2003	1349	188 (13.9)
2004	1879	252 (14.0)
2005	2425	242 (10.0)
Total	11748	961 (8.2)

Table 2: Gender distribution of screened patients & SS+ in Kano.

Years	Total Males tested	No of	Percentage positives (%)	Total tested	Females	Percentage positives (%)
2001	877		89 (10.2)	461		40 (8.7)
2002	660		89 (13.5)	680		51 (7.5)
2003	789		106 (13.4)	560		82 (14.6)
2004	1171		169 (14.4)	704		93 (13.2)
2005	1413		172 (12.2)	1012		70 (6.9)
Total	8331		625 (7.5)	3417		336 ((9.8)





Discussion

Nigeria being the fourth country with highest TB burden indicates the need for intensive. Directly Observed Therapy (DOTS) and awareness campaign strategy to bring the epidemics to an end. An important and encouraging indicator to note is the increasing number of patients being screened from 2001 to 2005 (1338 to 2425) patients respectively. This indicates increase in awareness and willingness from people to be screened. The prevalence of smear positive (SS+) PTB over these five years was only 8.2%. This is not surprising as the HIV prevalence in Nigeria was 4.4%⁵. Many studies have shown that among patients with TB - HIV co-infection, the prevalence of SS+ is also low, although in this study the HIV status of the screened patients was not analyzed. Harries *et.al*, has also reported that one out of every four HIV infected persons in the world is diagnosed with tuberculosis⁶. Gothic *et al* in India reported 96.8% of SS+ following a 24hr sputum collection⁷ while Warren *et al* reported 92% SS+ when more than 5 ml of sputum specimen was used for the smear preparation⁸. In general the recommended guidelines was to use 5 -10ml of sputum⁹. Another factor which may cause the low prevalence in this study may be associated with the quality and suitability of the collected samples. Although the prevalence was low, ZN remains the only most important test available for TB diagnosis in most developing countries¹⁰. In 1997, new cases of TB totaled an estimated 7.96 million globally including 3.52 million cases (44%) of infectious pulmonary disease (smear-positive).¹¹

With commencement of the free HIV care in Kano, the number of TB cases began to rise as all HIV patients are screened for TB. The awareness as well as the acceptance of the free HIV/DOTS program may explain the rise in number of patients being tested from 2001 to 2005. This may explain the low level of the SS+ in general and even the decline observed in 2005 to 10% after a steady rise from 2001 through 2004. The Government of Nigeria in collaboration with donor agencies had provided the so called "Stop TB Strategy" which includes expanded DOTS services to 51 LGAs in 17 States of the Federation.

There is need to improve on sample collection and the quality of the ZN technique carried out for detection of AFB. The TB prevalence in Kano may still be higher than our 8.2% result indicates. A much larger study is advised.

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