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Ph.D. Dissertation

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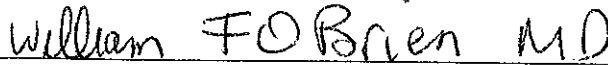
HAMISU MOHAMMED SALIHU

with a major in Epidemiology has been approved
for the dissertation requirement on November 28, 2000
for the Doctor of Philosophy degree.

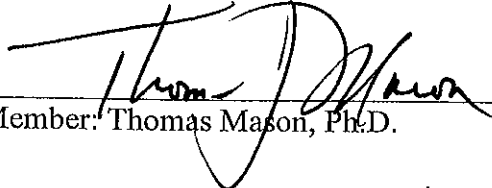
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ESTIMATING THE IMPACT OF THE HUMAN IMMUNODEFICIENCY VIRUS
INFECTION ON SPUTUM CULTURE CONVERSION IN PATIENTS DIAGNOSED
WITH PULMONARY TUBERCULOSIS: A POPULATION-BASED STUDY

by

HAMISU MOHAMMED SALIHU

An Abstract

of a dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
Department of Epidemiology and Biostatistics
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University of South Florida

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Co-Major Professor: Eknath G. Naik, M.D., Ph.D.
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Evaluation of the response of HIV-positive individuals to the standard six-month anti-tuberculosis regimen has been confined to hospital and clinic environment, which offers results that are limited in scope. In order to have a comprehensive understanding of anti-tubercular treatment outcome in HIV-positive patients, we conducted a population-based study in the State of North Carolina with the following aims:

1. To determine socio-demographic risk factors for the development of tuberculosis.
2. To determine the overall rate of anti-tubercular treatment response using sputum-culture conversion as measurement yardstick, as well as to delineate predictors of conversion.
3. To estimate the association between sputum-culture conversion and HIV-sero status.

Results: There was a highly significant drop in the overall incident cases of tuberculosis over the study period averaging 1 case per 200,000 person-years ($p = 0.0001$). Male individuals had twice the risk for females (rate ratio (RR)= 2.16, CI=2.07-2.24), and the elderly (age=65+) constituted the age group with the highest risk (RR=18.30, CI=16.41-20.32). For every Caucasian affected with tuberculosis, six Blacks, six Hispanics and eight Asians have already got the disease.

With respect to treatment outcome, sputum-culture conversion rate rose significantly from 52.90% in 1993 to a peak of 76.7% in 1998, representing on average, a 9.8% annual increase in the rate of sputum conversion over time ($p = 0.017$). Patients coinfecting with HIV had about 50% higher rate of non-conversion than HIV-uninfected cases (adjusted OR=0.48, CI=0.34-0.69). Age ($p = 0.0002$), gender ($p = 0.02$) and type of care provider

($p < 0.0001$) were the other variables that demonstrated significant and independent association with sputum-culture conversion. Using the Cox's Proportional Hazard, which also takes into account the variability in time to conversion, HIV-seropositivity was found to be associated with a significantly lower likelihood of sputum conversion (adjusted hazard ratio=0.56, CI=0.46-0.69).

Conclusion : Coinfection with HIV in tuberculosis patients compromises response to anti-tuberculosis therapy. A thorough re-evaluation of the current 6-month anti-tuberculosis regimen for HIV-infected patients is recommended.

Abstract Approved :

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