Symptom-based Screening for Tuberculosis among Pregnant Women Living with HIV in Kenya

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BACKGROUND

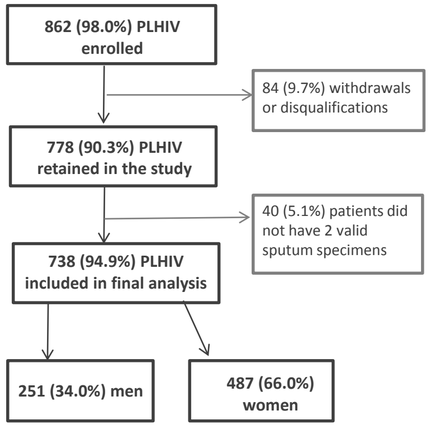
- Limited data exist on the performance of the World Health Organization (WHO) symptom-based tuberculosis (TB) screening algorithm among pregnant women living with HIV
- TB screening for women receiving prevention of mother-to-child HIV transmission (PMTCT) services was implemented as part of a TB intensified case finding study in Nyanza Province, Kenya from May 2011–June 2012

METHODS

- Prospective recruitment of people living with HIV (PLHIV), including pregnant women enrolling in PMTCT services, at 15 randomly-selected HIV clinics in 4 districts of Nyanza Province
- Patient inclusion criteria
  - Age 7 years or older
  - Documented HIV infection
  - No HIV care or treatment (including PMTCT services) in the preceding 2 years
  - No TB diagnosis or treatment in preceding 1 year
- All PLHIV received TB assessment at enrollment:
  - WHO-recommended symptom screening
  - Chest radiograph (deferred for pregnant women)
  - Collection of 3 sputum specimens (regardless of symptoms) for smear microscopy, liquid culture, and Xpert MTB/Rif testing (Xpert)
- Patients who did not have at least 2 sputum specimens with valid results (i.e. uncontaminated liquid culture and no error on Xpert) were excluded
- Remaining patients were classified as follows:
  - Pulmonary TB: *Mycobacterium tuberculosis* complex (MTBC) confirmed by one Xpert or one culture
  - No TB: No MTBC on Xpert or culture

PRELIMINARY RESULTS

Figure 1. Study Population



- 134 pregnant women were enrolled, representing 18.2% of all PLHIV
- Pregnant women with TB did not have a significantly different baseline median CD4 count (408 cells/µL; IQR, 215–640 cells/µL) than pregnant women without TB
- 33 (24.6%) pregnant women reported at least one TB symptom at enrollment compared to 195 (55.2%) non-pregnant women and 143 (57.0%) men
  - Night sweats was most commonly reported (57.6% of symptomatic pregnant women)
  - Weight loss was least commonly reported (36.4% of symptomatic pregnant women)

Table 1. Baseline Characteristics and Performance of WHO Screening Algorithm in Study Population

Characteristic	All PLHIV (N=738)	Pregnant Women (n=134)	Non-Pregnant Women (n=353)	Men (n=251)
Median age, years (interquartile range, IQR)	30 (24–39)	25 (22–29)	28 (24–37)	37 (29–48)
Median CD4 cell count, cells/µL (IQR)	344 (168–518)	401 (255–637)	360 (168–541)	294 (128–441)
Pulmonary TB	83 (11.3%)	8 (6.0%)	41 (11.6%)	34 (13.6%)
WHO Algorithm Performance				
Sensitivity	74.4%	28.6%	80.0%	77.4%
Specificity	49.4%	74.6%	44.9%	40.5%
Negative Predictive Value	93.9%	94.8%	94.3%	92.1%
Positive Predictive Value	15.6%	6.1%	16.4%	16.8%
Negative Likelihood Ratio*	0.52	0.96	0.45	0.56
Positive Likelihood Ratio**	1.47	1.13	1.45	1.31

* Negative likelihood ratio is calculated as (1 – sensitivity) ÷ specificity.
**Positive likelihood ratio is calculated as sensitivity ÷ (1 – specificity).

CONCLUSIONS

- TB prevalence among pregnant women living with HIV was approximately half that of non-pregnant women and men living with HIV
- Half as many pregnant women reported TB symptoms at enrollment in HIV care as other PLHIV
- If TB diagnostic testing were limited to pregnant women reporting symptoms in the WHO algorithm, more than two-thirds of laboratory-confirmed pulmonary TB would have been missed
- Given its high negative predictive value among pregnant women, the WHO algorithm may be more useful for identifying candidates for isoniazid preventive therapy than for TB case finding
- Additional analyses are needed to confirm these findings and assess whether different clinical or laboratory-based (e.g. Xpert) screening algorithms are more sensitive among pregnant women living with HIV

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