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INCIDENCE OF TUBERCULOSIS IN SOUTH AFRICAN WOMEN LIVING WITH HIV DURING PREGNANCY AND POSTPARTUM

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BACKGROUND

- Tuberculosis (TB) causes considerable morbidity and mortality in pregnancy and postpartum, particularly in women with HIV (WWH).
- The risk of active TB is lower in non-pregnant adults with obesity or overweight vs normal or underweight adults, but this is unclear in pregnancy and postpartum.

METHODS

Study population

- WWH and HIV seronegative women (HIV-) aged >18 years (y) and <18 weeks (w) gestational age (GA) attending routine antenatal primary care in Cape Town, South Africa were enrolled in the Obesogenic oRigins of maternal and Child metabolic Health Involving Dolutegravir (ORCHID) study.
- All WWH were on tenofovir + lamivudine + dolutegravir (TLD).

Study measures

- At enrolment, GA was determined by ultrasound and women were weighed; based on the GA, a correction factor was applied to the weight to estimate pre-pregnancy weight.
- Follow-up through 24 months (m) postpartum included assessment of active TB diagnoses and treatment from routine public sector services based on symptom screening +/- bacteriologic confirmation.

Analysis

- Date of conception was estimated from GA at enrolment and TB events were classified as prevalent (already on treatment at conception) or incident (newly diagnosed in pregnancy or postpartum).
- TB incidence rates (IRs) were calculated and mixed effects Poisson models used to assess the association between pre-pregnancy BMI and TB IRs adjusting for potential confounders.

RESULTS

- Among 1,920 women (mean age 28y, median GA at enrolment 13w), 42% were WWH (median duration on ART 58m, interquartile range 26–98); among WWH, 7% had a CD4 <200 cells/mm^3 and 89% had a viral load <1000 copies/mL.
- TB prevalence was 0.4% at conception.

TB incidence remains high in WWH despite high levels of ART use.
TB rates were higher in women who were underweight vs normal weight.

RESULTS CONTINUED

- TB incidence rates in WWH and HIV- women were 1,658 (95% confidence interval [CI] 942–2920) and 99 (95% CI 14–704) per 100,000 person-years respectively (Table 1).
- In adjusted models, TB incidence rates were higher in WWH with a CD4 >200 cells/mm^3 (incidence rate ratio [IRR] 5.0; 95% CI 1.1–22.4) compared to HIV- women.
- Incidence rates were substantially higher in WWH with a CD4 <200 cells/mm^3 compared to HIV- women though confidence intervals were wide (IRR 26.9; 95% CI 2.5–293.9).

Table 1. TB incidence rates by HIV status and pre-pregnancy body mass index

Pre-pregnancy BMI	Women with HIV		HIV seronegative women		All participants	
	Events/PYO	IR/100,000 py (95% CI)	Events/PYO	IR/100,000 py (95% CI)	Events/PYO	IR/100,000 py (95% CI)
<18.5	2/15	13068 (3268–52252)	0/22	--	2/37	5433 (1359–21725)
18.5–24.9	1/126	463 (65–3285)	1/253	396 (56–2810)	2/469	427 (107–1706)
>25	9/492	1828 (951–3514)	0/734	--	9/1226	734 (382–1411)
Total	12/724	1658 (942–2920)	1/1008	99 (14–704)	13/1732	751 (436–1293)

BMI, Body mass index; CI, confidence interval; IR, Incidence rate; py, person-years; PYO, Person-years of observation.

Table 2. Mixed effects Poisson regression modelling incident TB from conception to 3 months postpartum

	Unadjusted	Adjusted
	IRR (95% CI)	aIRR (95% CI)
Age, years	1.0 (0.9–1.1)	1.0 (0.9–1.1)
HIV/CD4 category		
HIV negative	Ref	Ref
With HIV and CD4 ≥200 cells/mm^3	4.3 (1.1–16.7)	5.0 (1.1–22.4)
With HIV and CD4 <200 cells/mm^3	118.3 (2.0–168.8)	26.9 (2.5–293.9)
Pre-pregnancy BMI (kg/m^2)		
<18.5	22.4 (1.6–314.2)	32.6 (2.3–455.2)
18.5–24.9	Ref	Ref
>25	1.8 (0.4–8.6)	2.4 (0.4–13.5)
Basic education vs post-secondary	0.8 (0.1–7.7)	1.0 (0.1–11.6)
Antenatal vs postnatal period	0.9 (0.3–2.2)	0.9 (0.3–2.3)

aIRR, Adjusted incidence rate ratio; BMI, Body mass index; CI, Confidence interval; IRR, Incidence rate ratio.

- TB IRs were significantly increased if pre-pregnancy BMI was <18.5 kg/m^2 vs 18.5–24.9 kg/m^2 (IRR 32.6; 95% CI 2.3–455.2).
- IRs for women with pre-pregnancy overweight or obesity were higher than for women with normal BMI but this was not statistically significant.

CONCLUSIONS

- TB IRs remained high in WWH despite ART in this setting.
- Rates were higher in underweight vs normal weight and appeared higher in women living with overweight and obesity vs normal weight, but this requires further investigation.

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Healthy pregnancies. Healthy children. Healthy and optimal lives.