Stillbirth in HIV-infected women delivering in UK/Ireland between 2007 and 2015

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Background and aims

- Stillbirth (SB) rate among HIV+ women is higher than general population.
- The UK/Ireland National Study of HIV in Pregnancy and Childhood (NSHPC) is a national surveillance study of women living with HIV delivering in UK/Ireland. Between 1990-2006 1.1% of pregnancies reported to the NSHPC ended as a SB.
- We aimed to assess the current SB rate in HIV+ women in the UK and associated risk factors and compared this rate with the SB rates in the general population by maternal origin using data from the UK Office for National Statistics (ONS).

Methods

- Inclusion: Births at ≥ 24 gestational weeks (GW), singleton.
- Definition: SB: a baby delivered at ≥24 GW showing no signs of life.
- Period: 2007-2015.
- Poisson regression models to explore whether: maternal characteristics (age, parity, maternal origin), co-morbidities (pre-eclampsia, diabetes), low CD4 count (≤350 cells/μL), late antenatal booking (at ≥12 GW) and year of delivery were associated with SB.
- Multiple imputation with chained equations (MICE) dealt with missing data and robust standard errors accounted for repeated pregnancies per woman.

Results

PREGNANCY CHARACTERISTICS

- 10,434 singleton pregnancies in 8,090 mothers.
- 75% of pregnancies in mothers born in sub-Saharan Africa
- 34% pregnancies with CD4≤350 cells/μL; 50% pregnancies conceived on ART.
- 2.7% pregnancies with pre-eclampsia, 3.0% with pre-existing or gestational diabetes.

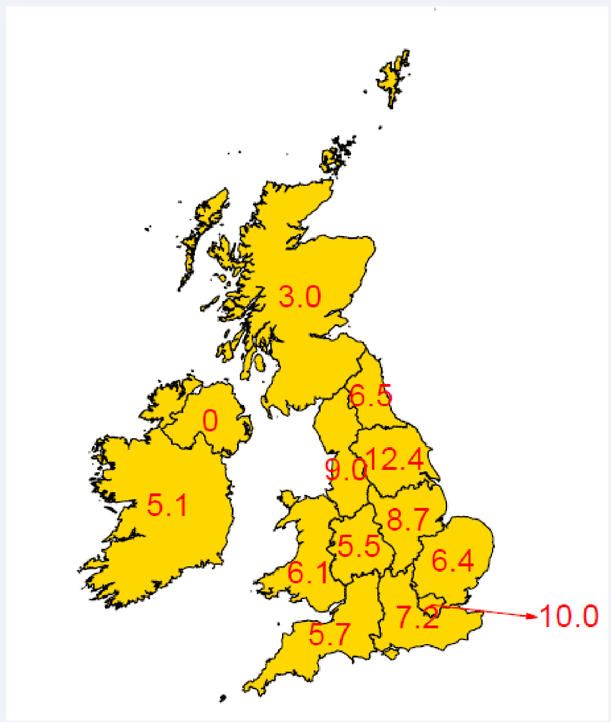

Figure 1 SB rate (per 1,000 births) in HIV+ women by geographical area of delivery

STILLBIRTH CHARACTERISTICS

- 89 SB (0.9%).
- SB rate declined from 1.1% in 2007-2008 to 0.6% in 2013-2015.
- Highest SB rate in London and Yorkshire &Humber (Fig1)

- SB compared to live births:
  - born at <37GW (73% vs. 11%)
  - SGA (55% vs 21%)
  - males (58% vs 50%)
  - congenital anomalies (16% vs 3%)

COMPARISON WITH ONS STATISTICS

TABLE 1 Standardised SB cases in HIV+ women in England & Wales in 2007-2015 by maternal origin using ONS data as a standard

Maternal origin	Observed	Expected	SSBR [a]	95%CI
Asia	**6**	**1.7**	**3.6**	**(1.3, 7.8)***
Caribbean	1	1.4	0.7	(0.0, 4.1)
East Africa	**42**	**29.9**	**1.4**	**(1.0, 1.9)***
Southern Africa	2	2.3	0.9	(0.1, 3.2)
Rest Africa	23	20.2	1.1	(0.7, 1.7)
UK/Ireland	6	6.0	1.0	(0.4, 2.2)
WEWC/EE [b]	2	2.0	1.0	(0.1, 3.6)

*statistically significant (P<0.05); [a] SSBR = Standardised Stillbirth Ratio; [b] WEWC/EE = Western Europe and Westernised Countries/Eastern Europe

- Standardised SB rates for maternal origin were significantly higher in East Africa-born (but not other African countries) and Asia-born women but not in UK/Ireland-born women (Table 1).

POISSON REGRESSION AND RISK FACTORS FOR SB

- Significant risk factors from multivariate analysis results:
  - pre-eclampsia (Incidence Risk Ratio [IRR] 8.3, 95%CI 4.4-15.5)
  - diabetes (IRR 2.8, 95%CI 1.1, 7.2)
  - maternal origin Asian vs. UK/Ireland (IRR 4.0, 95% CI 1.4-11.5)
  - low CD4 count (IRR 1.7, 95% CI 1.1-2.6)
  - older age (IRR per 1 year increase: 1.1, 95% CI 1.0-1.1)
  - primiparity (IRR 1.7, 95% CI 1.1-2.7)
- No significant risk for SB associated with late antenatal booking or ART at conception.

Discussion

- SB rate remains consistently higher in women living with HIV than in the general population but it declined over the study period.
- Higher rates in HIV+ women partly explained by high rates of SB in African-born women (main group in the NSHPC) compared to UK-born women.
- Low CD4 count is a risk factor for SB but pre-eclampsia and, to a lesser extent, diabetes are the strongest risk factor for SB.
- Limitations to our study: the NSHPC does not routinely collect data on: history of SB, maternal BMI, socio-economic status, smoking, ante/intrapartum SB.

Conclusions

- Further research is needed to understand the circumstances around SB in women living with HIV in order to identify possible interventions.
- The NSHPC plans to undertake an audit of pregnancies ending in SB (following established methodology used in an ongoing audit of cases in which mother-to-child-transmission occurred).
- Further research is needed to explore pre-eclampsia and diabetes in the context of HIV.

References
1. Townsend et al, BJOG 2008

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