

Transmission of HIV and non-HIV TB cases in Mississippi: Intensified Efforts are needed among African Americans and HIV-infected sub-populations.

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Introduction

HIV infection has been well documented as an increased risk of tuberculosis (TB) infection and reactivation. Previously, we noted that HIV co-infection, belonging to the African American race and homelessness were risk factors for recently transmitted TB disease in one urban county in Mississippi. This county was noted to have a high degree of TB clustering with over 64% of those infected, belonging to six clustered TB strains.

With molecular epidemiology we investigate TB co-infection and transmission dynamics among HIV seropositive (HIV +) and seronegative (HIV -) individuals in all counties in Mississippi.

Methods (1)

•A retrospective study of HIV infected and non-infected unduplicated culture positive TB cases diagnosed in Mississippi from January 2004 to December 2010. There were 595 culture positive TB cases, 562 had complete or close to complete data available for analysis (demographic, social and clinical).

•We secured IRB approval from MSDH and the VA medical Center

•Data was extracted from the Mississippi State Department of Health, central database (CDCIS).

•Genotyping and strain identification were performed by the CDC, using spoligotyping, mycobacterial interspersed repetitive unit (MIRU) and IS6110-based restriction fragment length polymorphism (RFLP) analysis when appropriate. Clusters were identified as having >2 individuals with the same strain pattern.

•Lineage and sub-lineage data was reported from the CDC.

•Chi-squared or Fisher exact analysis was used to describe categorical variables and student t-test for continuous variables.

•Statistical analysis was performed using STATA and SPSS

Results (1)

Table 1: Demographic, social and clinical characteristics of HIV positive and negative individuals

Demographic	HIV positive		HIV negative		p-Value
	N=59		N=503		
Mean age (STD)	45.07 (1.14)		51.54 (0.854)		0.01
Sex	n	%	n	%	
Males	48	81.36%	357	71.0%	0.12
Females	11	18.64%	146	29.0%	
Race					
Non-black	12	20.34%	226	44.93%	<0.001
Black	47	79.66%	277	55.07%	
Social					
Country of Origin*					0.132
US Born	55	94.8%	437	87.2	
Non-US Born	3	5.2%	64	12.8%	
Homeless*	23	38.98%	51	10.1%	<0.001
Alcohol Abuse w/in 12 months of diagnosis*	12	20.34%	110	21.9%	0.87
Incarceration w/in 24 months of diagnosis	3	5.1%	16	3.2%	0.44
Clinical					
Pulmonary TB	50	84.7%	453	90.1%	0.21
Previous TB	9	15.3%	57	11.3%	0.39
Sputum Smear Positive	31	53.45%	292	59.84%	0.39
TST positive*	23	56.1%	315	75.7%	0.006
Chest X-ray*					
Normal	9	15.0%	20	4.0%	0.002
Abnormal					
Cavitary	6	12.50%	157	33.26%	0.003
Non-Cavitary	42	87.50%	315	66.74%	
Medication Resistance*					
INH	4	7.02%	24	4.85%	0.52
Rifampin	0	0%	3	0.61%	1.00

*Total N less than 562

Results (2)

Chart 1: Dominant vs. Non-dominant TB cases in Mississippi, 2004 – 2010.

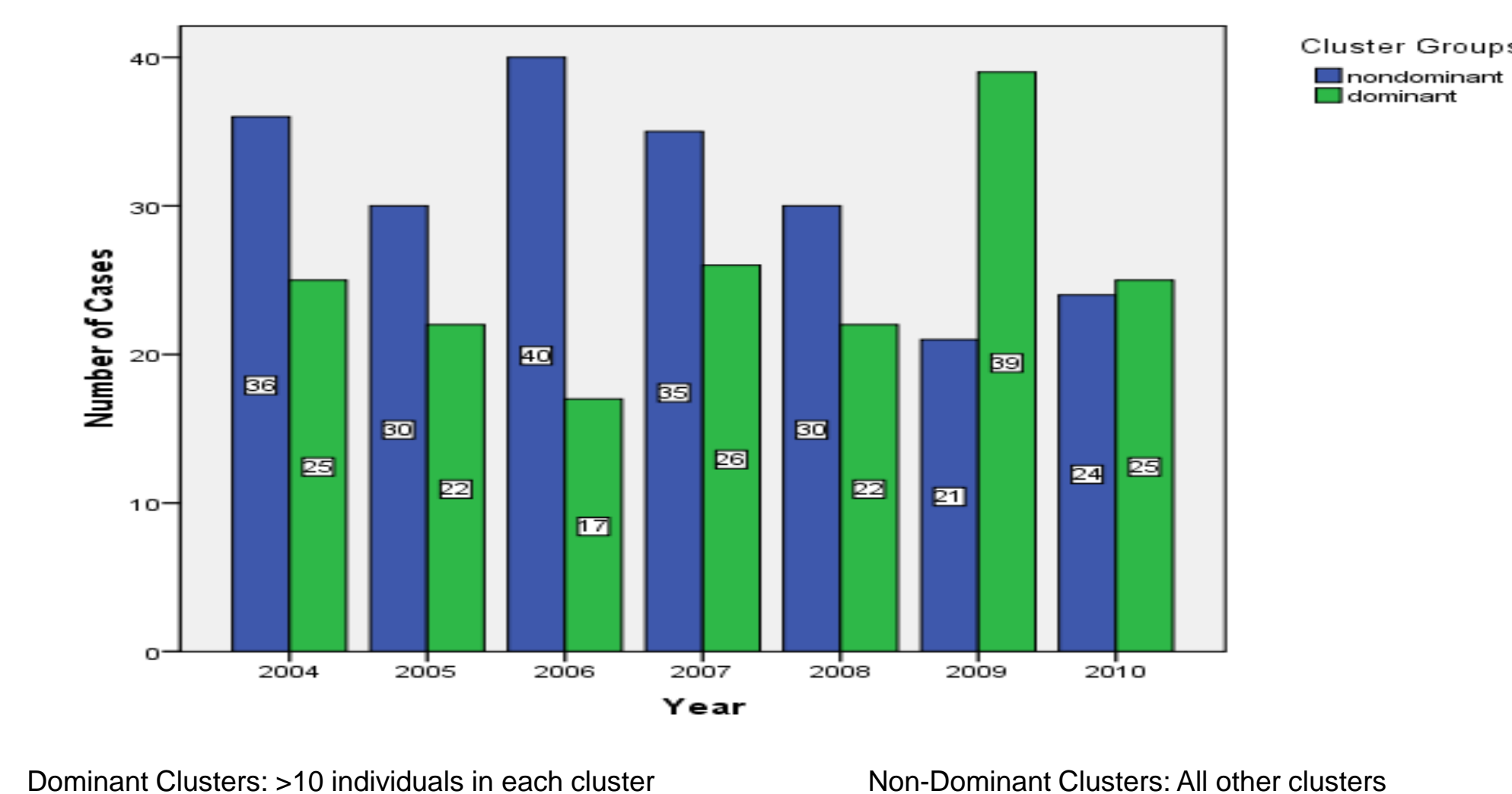


Table 2: Genotype Lineage of all individuals.

Genotype Lineages*	n	%
East African Indian	3	0.5
East Asian	45	7.6
EuroAmerican	520	87.4
IndoOceanic	14	2.4
Unknown	13	2.2
Total	595	100.0

*Representative of 90 total TB strains

Table 3: Largest TB clusters of HIV + and HIV – individuals

Cluster*	HIV – (N=503)	HIV + (N=59)
MS0006	41	24
MS0003	32	4
MS0013	22	0
MS0023	16	1
MS0018	10	2
MS0004	9	0
MS0019	8	3
MS0043	7	0

*8/58 of the largest TB clusters

• There were 90 *Mycobacterium tuberculosis* strains with 58 TB clusters, 87% were of the EuroAmerican Lineage.

• There was a high degree of clustering within the state. 41% of HIV+ individuals belonged to the MS0006 cluster; MS0006 (24/59) and MS0003 (4/59) strains.

• In a sub-analysis of MS0006 strain, AA were more likely to be HIV+ ($p=0.04$); no statistical difference was noted in any of the other key demographic and clinical characteristics.

Discussion and Conclusion

HIV + individuals were younger and more likely to be homeless, similar to our previous study. They were also more likely to be TST negative ($p = 0.006$), have normal chest x-ray ($p = 0.002$), if abnormal were more likely to have non-cavitary findings ($p = 0.003$). African American race was a risk factor for HIV/TB co-infection and belonging to the MS0006 TB cluster.

Of interest, there was no difference noted in smear positivity between the HIV+ and HIV- groups. Measures to interrupt TB transmission in African Americans and HIV co-infected populations are necessary to accelerate TB elimination in Mississippi, as a high degree of transmission was noted within these groups.

Grants and Support

The Miriam Hospital (T32 and R25 research development grant) and NIH Project number: 5R25MH083620-03 and 5T32DA013911-10

We would like to acknowledge Gail Bishop, RN at the MSDH for her assistance with the data retrieval during this project.