

# The contribution of Maternal Malaria Exposure and Metabolic Markers to Change in Blood Pressure (BP) in Nigerian Children over the first 3 Years of Life.

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## Background

- Malaria is endemic in Nigeria and hypertension is common.
- Exposure to maternal malaria results in smaller babies.
- These babies have lower BP at birth but a greater change ( $\Delta$ ) in BP to 12 months of age.

**We now present BP measurements out to 3 years of age.**

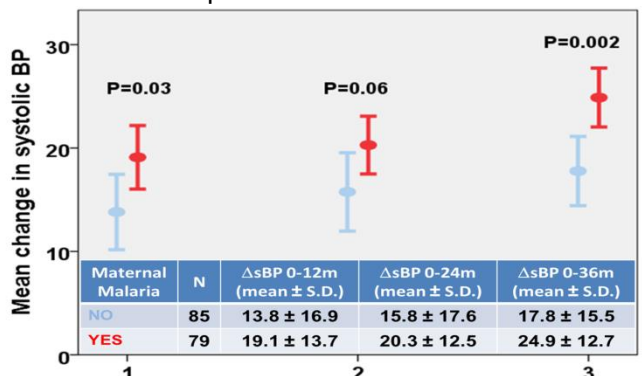
## Methods

- Height, weight and BP were measured on 164 babies (75 male: 89 female) at birth, 12, 24 and 36 months.
- Blood samples collected at 12 months were analysed for IGF-I, lipids (triglyceride, high and low density lipoprotein, cholesterol, insulin, adiponectin and leptin).
- The effect of malaria on systolic BP and change in systolic BP ( $\Delta$ sBP) over 0-12 and 0-36 months was compared by T-Tests.
- Backward regression analysis was used to assess the association of malarial exposure, sex and biochemical variables on  $\Delta$ sBP over time (variables excluded at  $p > 0.1$ ).

## Results

### Figure 1. The effect of malarial exposure in utero on change in systolic Blood Pressure ( $\Delta$ sBP) over time (years).

- $\Delta$ sBP over 0-12 months was higher in babies exposed to maternal malaria.
- This effect persisted to 36 months.



## Conclusion

- Changes in systolic BP are greater in children exposed to maternal malaria.
- Changes are more pronounced in females than males.
- This increased change in systolic BP is independently associated with lower leptin and LDL levels.

**Table 1 Effect of Gender on  $\Delta$ sBP 0-36m.**

- Overall  $\Delta$ sBP 0-36 months was lower in females ( $\Delta$ 20mmHg) than males ( $\Delta$ 23mmHg).
- However, the impact of malaria was more pronounced in females (+8.7mmHg with malaria;  $p=0.003$ ) than males (+5.0mmHg;  $p=0.15$ ).

Gender	Malarial exposure	N	Mean	S.D.	Malarial difference	P value
Male	no malaria	38	20.5	17.7	5.0mm Hg	0.15
	malaria	37	25.5	11.3		
Female	no malaria	47	15.6	13.3	8.7mm Hg	0.003
	malaria	42	24.3	13.9		

**Table 2. Factors associated with  $\Delta$ sBP 0-12m.**

- Backward linear regression identified leptin and LDL as negative factors and malarial exposure and HDL as weaker positive factors.

	B Coeff	S.D.	P value
leptin (ng/ml)	-.094	.035	.008
LDL	-4.548	1.702	.009
malarial status	5.260	2.669	.052
HDL	7.938	4.448	.078

**Table 3. Factors associated with  $\Delta$ sBP 0-36m.**

- Leptin, gender and LDL were negative factors whilst malarial exposure and IGF-I were positive.

	B Coeff	S.D.	p
malarial status	8.142	2.476	.001
leptin (ng/ml)	-.100	.032	.003
IGF-I (ng/ml)	.099	.045	.029
Gender	-5.351	2.544	.038
LDL	-2.905	1.545	.063