CELEBRATES SCIENCE

MAY 2016
**Summary:**
We thank Sheila Bird for her interest in our trial.1 The effect sizes used for the sample size calculation for the trial1,2 stemmed from clinical information available before August, 2011, with an assumed range for mother-to-child transmission of 3% to 5% for the lamivudine group. The expected transmission rate of 1·0% to 2·5% in the lopinavir–ritonavir group was deemed to be of clinical significance. The observed transmission rate in the lamivudine group was less than half that expected,3 while the rate in the lopinavir–ritonavir group was within the expected range.
Summary
Background: The most important risk factor for early-onset (babies younger than 7 days) invasive group B streptococcal disease is rectovaginal colonisation of the mother at delivery. We aimed to assess whether differences in colonisation drive regional differences in the incidence of early-onset invasive disease.

Methods: We did a systematic review of maternal group B streptococcus colonisation studies by searching MEDLINE, Embase, Pascal Biomed, WHOLIS, and African Index Medicus databases for studies published between January, 1997, and March 31, 2015, that reported the prevalence of group B streptococcus colonisation in pregnant women. We also reviewed reference lists of selected studies and contacted experts to identify additional studies. Prospective studies in which swabs were collected from pregnant women according to US Centers for Disease Control and Prevention guidelines that used selective culture methods were included in the analyses. We calculated mean prevalence estimates (with 95% CIs) of maternal colonisation across studies, by WHO region. We assessed heterogeneity using the $I^2$ statistic and the Cochran Q test.

Findings: 221 full-text articles were assessed, of which 78 studies that included 73 791 pregnant women across 37 countries met prespecified inclusion criteria. The estimated mean prevalence of rectovaginal group B streptococcus colonisation was 17·9% (95% CI 16·2–19·7) overall and was highest in Africa (22·4, 18·1–26·7) followed by the Americas (19·7, 16·7–22·7) and Europe (19·0, 16·1–22·0). Studies from southeast Asia had the lowest estimated mean prevalence (11·1%, 95% CI 6·8–15·3). Significant heterogeneity was noted across and within regions (all $p$≤0·005). Differences in the timing of specimen collection in pregnancy, selective culture methods, and study sample size did not explain the heterogeneity.

Interpretation: The country and regional heterogeneity in maternal group B streptococcus colonisation is unlikely to completely explain geographical variation in early-onset invasive disease incidence. The contribution of sociodemographic, clinical risk factor, and population differences in natural immunity need further investigation to understand these regional differences in group B streptococcus maternal colonisation and early-onset disease.
Article:

DOI: 10.1093/cid/civ1204
Impact Factor: 8.736

Summary

Background: The public health impact of rotavirus vaccination in African settings with a high human immunodeficiency virus (HIV) infection prevalence is yet to be established. We evaluated trends in all-cause diarrheal hospitalizations in Soweto, Johannesburg, before and after the introduction of rotavirus vaccine into South Africa's national immunization program in August 2009.

Methods: Hospitalizations in children <5 years of age with a diagnosis of diarrhea, defined by International Classification of Diseases, Tenth Revision codes A00-A05, A06.0-A06.3, A06.9, A07.0-A07.2, A07.9, and A08-A09, were identified at the Chris Hani Baragwanath Academic Hospital from 1 January 2006 to 31 December 2014. The median annual prevaccine (2006-2008) hospitalization incidence was compared to that of the vaccine era (2010-2014), and stratified by age group and HIV infection status.

Results: Incidence reductions (per 1000 population) were greatest in children aged <12 months: 54.4 in the prevaccine era vs 30.0, 23.6, 20.0, 18.8, and 18.9 in the postvaccine years 2010-2014, respectively (a 44.9%-65.4% reduction). Lower incidence reductions (39.8%-49.4%) were observed among children aged 12-24 months from the second year post-vaccine introduction onward. Reductions were observed in both HIV-infected and HIV-uninfected children. There was a change in the seasonal pattern of diarrheal hospitalizations post-vaccine introduction, with flattening of the autumn-winter peaks seen in the prevaccine years.

Conclusions: An accelerated and sustained decline in all-cause diarrheal hospitalizations, temporally associated with rotavirus vaccine introduction, was observed in children <2 years of age. However, the impact of other interventions such as improved sanitation and changes in HIV management cannot be discounted.
**Article:**


**Impact Factor: 8.121**

**Summary**

**Background:** User-friendly, rapid, inexpensive yet accurate TB diagnostic tools are urgently needed at points of care in resource-limited settings. We investigated host biomarkers detected in serum samples obtained from adults with signs and symptoms suggestive of TB at primary healthcare clinics in five African countries (Malawi, Namibia, South Africa, The Gambia and Uganda), for the diagnosis of TB disease.

**Methods:** We prospectively enrolled individuals presenting with symptoms warranting investigation for pulmonary TB, prior to assessment for TB disease. We evaluated 22 host protein biomarkers in stored serum samples using a multiplex cytokine platform. Using a pre-established diagnostic algorithm comprising of laboratory, clinical and radiological findings, participants were classified as either definite TB, probable TB, questionable TB status or non-pulmonary TB.

**Results:** Of the 716 participants enrolled, 185 were definite and 29 were probable TB cases, 6 had questionable TB disease status, whereas 487 had no evidence of TB. A seven-marker biosignature of C reactive protein, transthyretin, IFN-γ, complement factor H, apolipoprotein-A1, inducible protein 10 and serum amyloid A identified on a training sample set (n=491), diagnosed TB disease in the test set (n=210) with sensitivity of 93.8% (95% CI 84.0% to 98.0%), specificity of 73.3% (95% CI 65.2% to 80.1%), and positive and negative predictive values of 60.6% (95% CI 50.3% to 70.1%) and 96.4% (95% CI 90.5% to 98.8%), respectively, regardless of HIV infection status or study site.

**Conclusions:** We have identified a seven-marker host serum protein biosignature for the diagnosis of TB disease irrespective of HIV infection status or ethnicity in Africa. These results hold promise for the development of a field-friendly point-of-care screening test for pulmonary TB.
Summary

Purpose: There is an ongoing search for new drugs and drug targets to treat diseases like Alzheimer’s disease, cancer and type 2 diabetes (T2D). Both obesity and T2D are characterized by the development of a cardiomyopathy associated with increased hypertension and compensatory left ventricular hypertrophy. Small, specific glycogen synthase kinase-3 (GSK-3) inhibitors were developed to replace lithium chloride for use in psychiatric disorders. In addition, they were advocated as treatment for T2D since GSK-3 inhibition improves blood glucose handling. However, GSK-3 is a regulator of hypertrophic signalling in the heart via phosphorylation of NFATc3 and β-catenin respectively. In view of this, we hypothesized that chronic inhibition of GSK-3 will induce myocardial hypertrophy or exacerbate existing hypertrophy.

Methods: Rats with obesity-induced prediabetes were treated orally with GSK-3 inhibitor (CHIR118637 (CT20026)), 30 mg/kg/day for the last 8 weeks of a 20-week diet high in sugar content vs a control diet. Biometric and biochemical parameters were measured, echocardiography performed and localization and co-localization of NFATc3 and GATA4 determined in cardiomyocytes.

Results: Obesity initiated myocardial hypertrophy, evidenced by increased ventricular mass (1.158 ± 0.029 vs 0.983 ± 0.03 g) and enlarged cardiomyocytes (18.86 ± 2.25 vs 14.92 ± 0.50µm²) in association with increased end-diastolic diameter (EDD = 8.48 ± 0.11 vs 8.15 ± 0.10 mm). GSK-3 inhibition (i) increased ventricular mass only in controls (1.075 ± 0.022 g) and (ii) EDD in both groups (controls: 8.63 ± 0.07; obese: 8.72 ± 0.15 mm) (iii) localized NFATc3 and GATA4 peri-nuclearly.

Conclusion: Indications of onset of myocardial hypertrophy in both control and obese rats treated with a GSK-3 inhibitor were found. It remains speculation whether these changes were adaptive or maladaptive.
1. **INTRAMURAL RESEARCH UNITS**

**Alcohol, Tobacco and Other Drug**

   **Impact Factor:** 0.990

   **Impact Factor:** 1.500

   **Impact Factor:** 2.850

   **Impact Factor:** 1.500

**Biomedical Research and Innovation Platform**

   **Impact Factor:** 3.189

**Biostatistics**

   **Impact Factor:** 6.724

   **Impact Factor:** 3.759

   **Impact Factor:** 44.002
   DOI: 10.1097/QAD.0000000000001075
   Impact Factor: 4.407

Burden of Disease
   DOI: 10.7196/SAMJ. 2016.v106i6.11034
   Impact Factor: 1.500

   DOI: 10.7196/SAMJ. 2016.v106i6.10379
   Impact Factor: 1.500

   DOI: 10.1007/s11524-016-0050-0
   Impact Factor: 2.046

Centre for Tuberculosis
   DOI: 10.1136/thoraxjnl-2015-207999
   Impact Factor: 8.121

   DOI: 10.1371/journal.pone.0154571
   Impact Factor: 3.057

   DOI: 10.1371/journal.pone.0155440
   Impact Factor: 3.057

   DOI: 10.1016/j.tube.2016.05.003
   Impact Factor: 2.952
Gender and Health
   **Impact Factor: 3.057**

Health Systems
   **Impact Factor: 3.057**

   **Impact Factor: 2.013**

   **Impact Factor: 3.063**

   **Impact Factor: 2.019**

HIV Prevention
   **Impact Factor: 3.063**

   **Impact Factor: 6.256**

MRC Office of Cancer
   **Impact Factor: 1.500**
MRC Office of Tuberculosis
**Impact Factor:** 2.450

**Impact Factor:** 8.736

Non-Communicable Disease
**Impact Factor:** 2.119

**Impact Factor:** None

**Impact Factor:** 1.022

**Impact Factor:** 3.057

**Impact Factor:** None

South African Cochrane Centre
**Impact Factor:** 1.896
2. **EXTRAMURAL RESEARCH UNITS**

**Antiviral Gene Therapy**

   DOI: 10.1016/j.jviromet.2016.05.008
   **Impact Factor: 1.508**

**Anxiety and Stress Disorders**

   DOI: 10.1007/s00702-016-1571-0
   **Impact Factor: 2.587**

   DOI: 10.1038/tp.2016.69
   **Impact Factor: 5.538**

   DOI: 10.1192/bjp.bp.115.164020
   **Impact Factor: 7.060**

   DOI: 10.1038/tp.2016.67
   **Impact Factor: 5.538**

**Developmental Pathways for Health**

   DOI: 10.1097/COH.0000000000000274
   **Impact Factor: 4.378**

   DOI: 10.1371/journal.pone.0154784
   **Impact Factor: 3.057**
   DOI: 10.1097/PHM.0000000000000532
   **Impact Factor: 2.064**

   DOI: 10.5830/CVJA-2016-038
   **Impact Factor: 1.022**

**Diarrhoeal Pathogens**

   DOI: 10.1016/S0140-6736(16)30604-3
   **Impact Factor: 44.002**

   DOI: 10.1016/j.meegid.2016.05.035
   **Impact Factor: 2.591**

**Herbal Drugs**

   DOI: 10.1016/j.jpba.2016.05.020
   **Impact Factor: 3.169**

   DOI: 10.1080/10412905.2016.1175386
   **Impact Factor: 0.871**

**HIV/TB Pathogenesis and Treatment**

   DOI: 10.1371/journal.pone.0155668
   **Impact Factor: 3.057**
Human Genetics
DOI: 10.2217/pgs.16.14
**Impact Factor: 2.710**

Hypertension and Cardiovascular Disease
DOI: 10.1038/hr.2016.48
**Impact Factor: 3.208**

DOI: 10.1016/S0140-6736(16)30467-6
**Impact Factor: 44.002**

Microbial Water Quality Monitoring
DOI: 10.1007/s12560-016-9246-4
**Impact Factor: 2.338**

Respiratory and Meningeal Pathogens
DOI: 10.1016/S1473-3099(16)30055-X
**Impact Factor: 21.372**

DOI: 10.1093/cid/civ1204
**Impact Factor: 8.736**

Rural Public Health and Health Transition
**Impact Factor: 2.180**
   DOI: 10.4054/DemRes.2016.34.30
   Impact Factor: 1.221

   DOI: 10.1186/s12889-016-3085-y
   Impact Factor: 2.209

   DOI: 10.1371/journal.pone.0155753
   Impact Factor: 3.057

   DOI: 10.1007/s10461-016-1374-1
   Impact Factor: 3.063
3. **GRANT FUNDED RESEARCH**

   **Impact Factor:** 1.500

   **Impact Factor:** 3.745

   **Impact Factor:** 7.295

   **Impact Factor:** 2.486

   **Impact Factor:** 2.461

   **Impact Factor:** 3.182

   **Impact Factor:** 1.500

   **Impact Factor:** None

   **Impact Factor:** 5.083
4. CLOSED RESEARCH UNITS

Exercise Science and Sports Medicine

Inter-University Cape Heart


5. RESEARCH UNITS WITH NO QUALIFYING PUBLICATIONS

Intramural
- Environment and Health
- MRC Office of AIDS
- MRC Office of Malaria
- Primate
- Violence, Injury and Peace

Extramural
- Bioinformatics Capacity Development
- Child and Adolescent Lung Health
- Common Epithelial Cancer
- Drug Discovery and Development
- Gynaecological Cancer
- Health Policy Research Group
- Health Services to Systems
- Immunology of Infectious Disease
- Inter-university Cape Heart
- Maternal and Infant Health Care Strategies
- Medical Imaging
- Molecular Mycobacteriology
- Prospective Gastrointestinal Cancer
- Receptor Biology
- Stem Cell Research and Therapy
# 6. GRANTS AWARDED

## SAMRC LIST OF NEW CONTRACTS FOR MAY 2016

<table>
<thead>
<tr>
<th>MRC Unit</th>
<th>Funder</th>
<th>Project Title/Description</th>
<th>Contract Value</th>
<th>Rand</th>
<th>Foreign Currency</th>
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<tr>
<td>Environmental &amp; Health</td>
<td>National Research Foundation (NRF)</td>
<td>Incentive Funding for Rated Researches</td>
<td>240 000</td>
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<tr>
<td>Health Systems</td>
<td>National Research Foundation (NRF)</td>
<td>Incentive Funding for Rated Researches</td>
<td>480 000</td>
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<tr>
<td>HIV Prevention</td>
<td>National Research Foundation (NRF)</td>
<td>Incentive Funding for Rated Researches</td>
<td>480 000</td>
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</tr>
<tr>
<td>Non-Communicable Disease</td>
<td>National Research Foundation (NRF)</td>
<td>Incentive Funding for Rated Researchers (IPRRR)</td>
<td>240 000</td>
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