of the checkerboard for AZ+TX indicated synergy for only 2 of the 15 strains (FICI: 0.16 and 0.5). The mean FICI of all strains was 0.64 (0.16–1.01). Adding AZ to TX could not lower the TX MIC below 0.25 for one TX resistant strain (MIC for TX alone: 2).

Conclusion The recommended combination therapy against Ng (AZ+TX) showed no in vitro synergy using either the Etest or the agar dilution method. Other combinations of antibiotics from various groups showed no indication of in vitro synergy using the Etest method.

**O21.5 UNDERSTANDING THE MOLECULAR MECHANISM OF MTRR IN THE REGULATION OF ANTIMICROBIAL RESISTANCE IN NEISSERIA GONORRHOEAE USING IN VITRO AND IN SILICO STUDIES**


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Background Neisseria gonorrhoeae, a major STD causing pathogens, tends to pose high burden of morbidity that is borne disproportionately by women and infants with approximately 2/3rd of cases from developing countries. In the absence of appropriate vaccine and rapid, easy, economical test, antibiotic therapy is recommended for treatment on the basis of clinical symptoms. This has led to the emergence of antibiotic resistant strains. Since increasing antimicrobial resistance makes Neisseria as super bug, we have tried to elucidate the mechanism of development of antibiotic resistance.

Methods Mutational analysis of mtrR gene and its DNA binding site was carried out for 28 clinical isolates resistant to multiple drugs. Wild type and mutant mtrR were cloned, expressed and purified. Fluorescence assay and electrophoretic mobility shift assay (EMSA) were carried out to study the effect of mutations in MtrR on its biological activity. Using discovery structure, structure of MtrR was modelled in-silico to understand how mutations affect its interaction with DNA.

Results Mutations in DNA binding domain (G45D) and dimerization domain of MtrR (H105Y) as well as in promoter region of MtrR (A/T deletion) were observed in clinical isolates (n = 28). EMSA and fluorometric results suggest decreased binding of mutant MtrR with DNA. Fluorescence shift and electrophoretic mobility shift assay (EMSA) were carried out to study the effect of mutations in MtrR on its biological activity. Using discovery structure, structure of MtrR was modelled in-silico to understand how mutations affect its interaction with DNA.

Conclusions Mutations in mtrR result is altered conformation of the protein leading to its decrease binding to DNA. This leads to enhanced expression of MtrCDE efflux pump resulting in increased efflux of drug.

**O21.6 A TALE OF TWO CITIES: TREPONEMA PALLIDUM MACROLIDE RESISTANCE IN COLOMBO (SRI LANKA) AND LONDON (UNITED KINGDOM)**


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Background The bacterium Treponema pallidum (T. pallidum) causes syphilis. Penicillin is effective treatment, but azithromycin (a macrolide) is a single-dose oral alternative for those with allergy. Unfortunately, macrolide resistance secondary to one of two 23S ribosomal RNA (rRNA) point mutations (A2058G and A2059G) is now wide-spread. Molecular strain-typing suggests that epidemics and macrolide resistance are unlikely the spread of single clones.

We present typing and macrolide resistance data from two geographically distinct populations: Colombo, Sri Lanka and London, UK.

Methods Cross-sectional studies were conducted at the Colombo District STD clinics and St Mary’s Hospital, London. Ulcer exudate and/or blood were collected from patients with microbiologically confirmed syphilis. Presence of T. pallidum DNA (tpp047 gene) was confirmed with PCR. Next, using published techniques, the 23SrRNA gene was PCR-amplified for a point-mutation assay and tpp0548, arp and tprE,G,B/F amplicons were used for strain-typing.

Results Sri Lanka: 24 T. pallidum PCR-positive samples were collected. Patients were men (45.9% MSM) and 91.6% Sinhalese with a mean age of 28 (range 29). None were HIV-1 infected. Two strain types were discovered (14b/f and 15b/f), neither harbouring macrolide resistance.

London: 43 men were recruited, 18 in 2006–8 and 25 in 2011–12. Mean age was 37.5 (range 45); 95.2% were MSM and 62.8% were HIV-1 infected. Half (22/43) were white British. A total of 5 full and 14 partial strain types were identified, of which 6 were unique. Macrolide resistance increased from 66.7% (12/18) in 2006–8 to 80% (20/25) in 2011–12.

Conclusion Colombo T. pallidum strains have limited diversity with no macrolide resistance. London strains are more varied and increasingly macrolide-resistant. Ethnic diversity in London exceeds Colombo’s and may explain increased strain diversity. In contrast to Sri Lanka, azithromycin is widely used to treat Chlamydia and non-specific urethritis in the UK thus selection pressure may be driving macrolide resistance.

**0.22 - Alternative screening tools and screening sites**

**O22.1 EVALUATION OF SYPHILIS POINT OF CARE TESTS CONDUCTED BY MIDWIVES AT PRIMARY HEALTH FACILITIES IN GHANA**


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Background Globally, over two million pregnancies are affected by syphilis annually, resulting in adverse pregnancy outcomes and severe sequelae in the newborn. Cost-effective strategies exist, which prevent vertical transmission. Ghana’s Policy recommends antenatal (ANC) syphilis screening and treatment of positive clients, but pregnant women were often not tested especially in areas where laboratory services are unavailable. The study examined the performance of point-of-care (POC) tests for screening ANC attendants for syphilis conducted by midwives at the primary level health facilities in Ghana.

Methods The study was conducted from March to September 2010. In all, 1249 pregnant women attending ANC in 8 sites were recruited and tested using Determine® Syphilis TF (POC) and results compared with Treponema Pallidum Haem-Agglutination Test (TPHA) and Rapid Plasma Reaginin test (RPR).

Results The sensitivity of tests conducted by midwives was 25%, 60% and 75% when compared with TPHA, active syphilis (reactive to TPHA and RPR) and High titre active syphilis (HTS) (greater than 1:8) respectively. A higher sensitivity was noted in detecting active syphilis and high titre infections. The prevalence of syphilis using POC test on whole blood conducted by midwives was 5.5% (70/1282), at the district laboratory on serum samples was 10.1%
proportion of female adolescent ED patients who are notified of positive STI tests (gonorrhoea, Chlamydia, or trichomoniasis) using mobile phone calls and texting.

Methods A randomised intervention among 14–21 year-old females using a 2X3 factorial design with replication to improve patient notification, defined as the proportion of STI-positive females notified within 7 days of STI testing. We evaluated six combinations of two factors: (1) method of notification (call, text message, or call + text message) and (2) provision of an STI information card with or without an ED phone number to obtain test results. Covariates for logistic regression included age, empiric STI treatment, days until first contact and documentation of a confidential/mobile phone number.

Results Of 386 patients, 51% were 18–21 years, 35% were 16–17 years and 14% were 14–15 years old. Successful notification was significantly greater for call + text message vs. call only (Odds Ratio [OR] 3.1, 95% confidence interval [CI] 1.4 – 6.7). There was no significant interaction between card and method of notification. Texting only or type of STI information card was not significantly associated with patient notification. Documenting a confidential phone number was independently associated with successful notification (OR 3.3, 95% CI: 1.6 –6.9). In total, 94% of those with a documented confidential phone number who received call + text message were notified of their positive STI results within 7 days of their ED visit.

Conclusions A combination of call + text messaging improved our ability to successfully notify adolescent women of their positive STI results after an ED visit. Documentation of a confidential phone number is also an important strategy to notify adolescent women of their STI results.