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TREPONEMA PALLIDUM STIMULATED MACROPHAGE-DERIVED EXOSOMAL MIR-146A-5P DECREASED MONOCYTE TRANSENDOTHELIAL MIGRATION

Qian-Qiu Wang*. Institute of Dermatology, Chinese Academy of Medical Sciences, Department of Clinical Management, Nanjing, China

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Background Exosomes are small vesicles containing a wide range of functional proteins, DNA and RNA. Exosomal RNAs have been implicated in many exosome-mediated biological functions. These cell-derived Exosomes contain numerous miRNAs, which can work locally or can enter the circulation to act at distal sites. Accumulating evidences indicate that exosomal miRNA is linked to the host immune response to infection. In this study, we focused on how *Treponema pallidum* evade immune clearance via exosome-mediated transfer of microRNAs.

Methods We first performed a comprehensive miRNA profiling in exosomes using microarray analysis. Thereafter, RT-PCR was performed to validate the expression of miR-146a-5p in exosome derived from macrophage stimulated by *Treponema pallidum* and syphilis patients. Laser confocal microscopy was used to trace exosomal miR-146a-5p secreted by macrophage into HUVECs. The effect of exosomal miR-146a-5p on monocytes cells transendothelial migration of HUVEC by using migration assay. Luciferase reporter assay were utilized to confirm the binding of exosomal miR-146a-5p to the 3'untranslated region of JAM-C.

Results MicroRNA array was performed and 65 miRNAs were identified. Among the identified miRNAs, miR-146a-5p was one of the most significantly changed miRNAs which high expression in *Treponema pallidum* derived exosomes. We also confirmed that miR-146a-5p was enriched in serum exosomes of syphilis patients. Exosomal miR-146a-5p of macrophages could be transferred into HUVEC and reduce monocyte transendothelial migration by directly targeting the promoter of JAM-C.

Conclusion Our data show that exosomes derived from macrophage stimulated by *Treponema pallidum* expressed high levels of miR-146a-5p which could be delivered to endothelial cells, and decreases monocyte transendothelial migration by targeting JAM-C in endothelial cells, which may enable *Treponema pallidum* evade the host immune clearance.

Disclosure No significant relationships.

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RISK FACTORS FOR PRIMARY AND SECONDARY SYPHILIS AMONG FEMALES IN CHICAGO, 2010–2017

¹Kimberly Stanford*, ²Irina Tabidze. ¹University of Chicago, Medicine, Chicago, USA; ²Chicago Department of Public Health, Chicago, USA

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Background Trends in congenital syphilis (CS) usually parallel those of primary and secondary (P&S) syphilis in women. Chicago has invested in a multi-pronged approach to address the syphilis epidemic in the city. Between 2010 and 2017, the total number of female P&S syphilis cases in Chicago decreased by 37% (from 87 to 55 cases) in parallel with a decrease in the number of CS cases (from 19 to 11). At the same time, national rates of CS increased 140%, from 9.7 per

100,000 live births in 2010, to a high of 23.3 per 100,000 live births in 2017.

Methods A retrospective analysis of surveillance data from 2010 through 2017 was performed on female cases of P&S syphilis (n=483) reported to the Chicago Department of Public Health.

Results Of 483 cases reported during this time, 382 (79.1%) were non-Hispanic black, 34 (7.0%) Hispanic, 27 (5.6%) non-Hispanic white, and 40 (8.3%) other or unknown ethnicity. Approximately 7% (32) of females were co-infected with HIV. The median age was 27 and did not change significantly over time, ranging from 24 to 32. Overall, 23% of interviewed females reported having sex while intoxicated with alcohol or drugs, and 15% reported having sex with anonymous partners. Only 6.2% of females diagnosed with P&S syphilis reported exchanging drugs for sex or money and <1% reported intravenous drug use or sex with partners using intravenous drugs.

Conclusion Our findings suggest that certain sexual behaviors, in particular anonymous sex and sex while intoxicated, are more frequently reported by women infected with syphilis. To curb the spread of CS further, there is a need to enhance surveillance and collect comprehensive behavioral risk factor data for females. Future interventions should focus on provider and public education, media campaigns targeted towards these sexual behaviors, and expansion of screening programs among females of reproductive age.

Disclosure No significant relationships.

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AN EVALUATION OF THE PROVINCIAL 'SYPHISTORY' CAMPAIGN IN BRITISH COLUMBIA, CANADA

Venessa Ryan*, Emma Cumming, Devon Haag, Joshua Edward, Michael Otterstatter, Troy Grennan, Jillian Arkles Schwandt, Bobbi Brownrigg, Mark Gilbert, Jason Wong. BC Centre for Disease Control, Clinical Prevention Services, Vancouver, Canada

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Background Infectious syphilis rates have been increasing in British Columbia (BC), Canada, primarily among gay, bisexual, and other men who have sex with men (gbMSM). In response, a provincial syphilis campaign ("Syphistory") was launched in January 2017, and included posters in venues frequented by gbMSM (physical and online) and a campaign-specific educational website. Goals of the campaign were to increase knowledge of syphilis and syphilis screening.

Methods Website metrics were collected and analyzed via Piwik Analytics tool. Pre and post-campaign surveys were conducted to assess knowledge of syphilis using a convenience sample of clients attending STI clinics in the Vancouver area. One-sided t-tests were used to analyze change in knowledge scores. Interrupted time series analysis was conducted to assess the change in syphilis screening rate among males before versus on or after January 2017.

Results During 2017 there were 4,421 unique visitors to the Syphistory educational website, of which 71% were between February and April. Mean survey score pre-campaign was 8.96/12 (n=137) and 9.12/12 (n=266) post-campaign (p=0.223). Those who reported seeing the campaign demonstrated a greater knowledge of syphilis (mean 9.7/12 versus 8.9/12, p<0.001). Provincial syphilis testing volumes among males were 93,311 and 101,967 in the 12 months before and after campaign implementation, respectively. Adjusting for the historical trend of increasing syphilis screening, there was a

statistically significant change in syphilis testing rate among males ($p=0.03$).

Conclusion Our campaign appeared to have reached people living in BC. Syphilis knowledge was high in our pre-campaign sample, which may represent a more educated cohort. Nevertheless, those who saw the campaign scored higher. Syphilis testing rate among males increased significantly after campaign implementation. Work is underway to evaluate the campaign among gbMSM.

Disclosure No significant relationships.

P758 USE OF A RAPID SYPHILIS TEST FOR SYPHILIS DIAGNOSIS AMONG PATIENTS PRESENTING TO AN STI CLINIC IN NORTH CAROLINA, USA

¹Arlene Seña*, ²Katie Mallette. ¹University of North Carolina at Chapel Hill, Division of Infectious Diseases, Chapel Hill, USA; ²Durham County Department of Public Health, Durham, USA

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Background Rapid treponemal antibody-based tests have been utilized for syphilis screening and diagnosis. In the United States (US), the Syphilis Health Check (SHC, Trinity Biotech) is the only FDA-cleared rapid test. However, there is a high proportion of false positives with SHC screening. We evaluated the performance of the SHC for syphilis diagnosis among patients presenting to an STI clinic in Durham, North Carolina (NC), US.

Methods Beginning in September 2017, the SHC was routinely performed for any patient in the STI clinic for whom a stat rapid plasma reagin (RPR) was requested and had no history of prior syphilis. The SHC and RPR were performed at the on-site laboratory using venous blood specimens. Confirmatory treponemal tests (e.g. enzyme immunoassay) were conducted for specimens with discrepant results at the state public health laboratory. We determined the performance of the SHC results in comparison with either a combined positive RPR/treponemal test or positive treponemal test as the standard for a "true positive."

Results Over a 16-month period, 182 unique patients who presented with symptoms and/or as contacts to syphilis underwent testing with a stat RPR and the SHC; the majority were African-American (83%) and male (74%). The SHC was positive in 66 patients; 9 of these cases had nonreactive RPRs but positive treponemal tests. The estimated sensitivity of the SHC was 91.3% (63/69), with a specificity of 97.3% (110/113). Of the 3 specimens with positive SHC but negative confirmatory testing, one was from an asymptomatic patient with contact to syphilis and an RPR 1:1.

Conclusion Rapid syphilis testing can be used to assist in the immediate diagnosis of STI clinic patients with suspected syphilis based on symptoms or exposure. The SHC had an acceptable sensitivity and specificity, with a low proportion of false-positives among a population with a high likelihood of syphilis infection.

Disclosure No significant relationships.

P759 EVALUATION OF THE FULLY AUTOMATED BIO-RAD BIOPLEX 2200 SYPHILIS TOTAL & RPR ANTIBODY DETECTION ASSAY

¹Vincent Boissonneault*, ¹Valérie Martel-Laferrrière, ²Bouchra Serhir, ¹Claude Fortin. ¹Centre Hospitalier de l'Université de Montréal, Département De Microbiologie Infectiologie, Montreal, Canada; ²Institut National de Santé Publique du Québec, Montréal, Canada

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Background Laboratory diagnostic of syphilis is based on both treponemal and non-treponemal assays. While automated treponemal assays are available, non-treponemal antibody testing continue to require extensive hands on time. The BioPlex 2200 Syphilis Total & RPR assay by Bio-Rad Laboratories is a fully automated assay that detects both treponemal and non-treponemal antibodies with on board RPR titer capability.

Methods We compared the BioPlex Total & RPR assay with the BiopPex IgG assay and with the Wampole Impact RPR card test for the treponemal and non-treponemal antibodies detection respectively. A total of 504 prospective sera sent to our laboratory for syphilis testing were tested with both BioPlex assays to establish agreement of treponemal results. Also, a panel of 52 sera with known titer values was provided by our reference laboratory. These sera were tested with the BioPlex Total & RPR assay and the manual Wampole RPR card to compare titer results, using essential agreement within 1 dilution range and correlation of log2 transformed titer values with Spearman coefficient.

Results Of the 504 sera tested, 112 were positive for treponemal antibodies with BioPlex Total & RPR and 109 with BioPlex IgG. Positive, negative and overall agreements were 95% (104/109)(95% CI [89%, 98%]), 98% (387/395)(95% CI [96%, 99%]) and 97% (491/504)(95% CI [95%, 99%]) respectively for these sera. Essential agreement within 1 dilution of quantitative RPR titer results for the 52 sera panel was 90% and the Spearman correlation coefficient of titers obtained with the two assays was 0.926 with a $p < 0.001$.

Conclusion The BioPlex 2200 Syphilis Total & RPR assay is a fully automated assay that compares favorably with the BioPlex 2200 Syphilis IgG assay and that yields non treponemal titers that correlates favorably with a traditional manual RPR card test. Reliable automated non treponemal assays are needed.

Disclosure No significant relationships.

P760 SENSITIVITY AND SPECIFICITY OF THE QUANTITATIVE TEST FOR TPPA AND RPR FOR DIAGNOSIS OF CONGENITAL SYPHILIS IN NEONATES

¹Xiangdong Gong*, ²Minzhi Wu, ¹Liang Zhao. ¹Institute of Dermatology, Chinese Academy of Medical Sciences and Peking Union Medical College, STD Clinic, Nanjing, China; ²The Fifth People's Hospital of Suzhou, Suzhou, China

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Background Diagnosis of congenital syphilis in neonates is difficult as TP-specific IgG can be passively transferred from mother to newborn, a reactive serologic test at birth does not