Introduction: Chemiluminescence immunoassay (CLIA), ELISA and rapid-tests (RDTs) are commonly used for detection of HBsAg. However, larger comparative studies evaluating electro-chemiluminescence immunoassay (ECLIA) are still fragmentary. This study compares the above three tests for evaluating their diagnostic accuracy and suggested a diagnostic cut-off index (COI) for ECLIA.

Methods: A cross sectional investigation was conducted in Department of Microbiology, JNMCH, Aligarh from July to December 2018 and a total of 3846 samples were included in the study. Representative samples that showed discrepancy between ELISA and ECLIA (Cobas-e411) were confirmed by nucleic acid amplification test (NAAT).

Results: Of the tested samples, 259 (6.73%) were positive by ECLIA. Out of these 259 samples, 68 were positive by both ELISA and ECLIA and had cut-off index (COI) >5 in ECLIA, whereas 191 were reactive by ECLIA only (COI between 0.9–5). The concordance rate of ECLIA and ELISA in detecting serum HBsAg was 26.25% while the same for ELISA and RDT was 31.57%. Representative samples with COI>9 were positive by NAAT and those with COI between 0.9–9 were negative by NAAT.

Conclusion: ECLIA is a highly sensitive test however positivity-COI be raised above 5. In doubtful cases combination of ECLIA and NAAT be used.

Biosynthesis of Silver Nanoparticles from Phyllanthus niruri Leaf Extracts and Its Antibacterial Activity Against Antibiotics-Resistant Clinical Isolates

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Objective: Synthesis and characterisation of silver nanoparticles using Phyllanthus niruri leaf extracts and determination of antimicrobial activity against clinical bacterial isolates.

Methods: Silver nanoparticles (AgNPs) were biosynthesised with the aqueous leaf extract of Phyllanthus niruri. Synthesised nanoparticles were characterised by UV-vis, FTIR, XRD, SEM-EDX and TEM. Clinical and standard isolates characterised by VITEK 2 were used for screening of antibacterial activity. The clinical strains tested were Streptococcus spp, Escherichia coli, Enterococcus faecalis, Enterobacter cloacae, Citrobacter freundii, Burkholderia cepacia complex, Salmonella typhi, carbapenem-resistant Enterobacteriaceae (imipenem-resistant strain of E. coli), MRSA and VRE. The standard strains were E. coli ATCC 25922, Pseudomonas aeruginosa ATCC 27853. Antimicrobial activities of the silver nanoparticles were tested by well-diffusion method.

Results: Nanoparticles showed significant activity against all the strains tested. Best activity was noticed against Pseudomonas aeruginosa ATCC with zone of inhibition (ZOI) of 30 mm followed by E. coli ATCC 25922 with ZOI 22 mm. Among the clinical isolates, the ZOI ranged between 12–16 mm with significant activity noticed against antibiotics-resistant bacteria such as MRSA, VRE and CRE.

Conclusion: Phyllanthus niruri-nanoparticles showed promising antibacterial results; especially, the activity against MRSA, VRE and CRE is quite promising and may be utilised in developing newer antimicrobial compound.

Intestinal Microbiota Predict Response and Toxicities During Anti-PD-1/Anti-CTLA-4 Immunotherapy

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Immunotherapies targeting PD-1/PD-L1 and CTLA-4 have revolutionised the treatment of malignant melanoma. Whilst combining strategies is associated with improved response rates, this is accompanied by increased incidence of severe immune related adverse events (irAEs). Given the ability of the gut microbiota to modulate both local and systemic immunity, this study aimed to examine the association of the gut microbiome with the subsequent efficacy and development of irAEs during combination immunotherapy in the neoadjuvant setting. Pre-treatment faecal microbiomes of stage III melanoma patients (n=38) were analysed using 16S sequencing. Low microbial diversity and a reduction in the abundance of butyrate-producing Ruminococcaceae and methanogenarchaea were associated with lack of response and the development of severe irAEs. Machine learning applied to the data was able to predict patients who would develop severe irAEs in the absence of tumour efficacy with 87% accuracy. Mass cytometry of matched pre-treatment PBMCs indicated that differences in peripheral immune cells were associated with changes in microbial diversity. Together, the data suggests that pre-treatment microbiomes influence systemic immunity and can be used to predict immunotherapeutic outcomes, and the maintenance of a robust microbial ecosystem that supports barrier function is key to developing successful microbial interventions to improve patient outcomes.