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A comparative study of the performance of loop mediated isothermal amplification (LAMP) and PCR for diagnosis of gonorrhea

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Conventional methods for detection of *Neisseria gonorrhoeae* causing gonorrhea have been gradually replaced by nucleic acid amplification tests (NAATs). However, all these NAATs have inherent disadvantages of requiring a high precision instrument for amplification or an elaborate complicated method for detection of amplified products. Thus, for settings with minimal facilities, there is a need for a simple reliable test that would permit the screening of *N. gonorrhoeae*. Therefore, in this study we develop and compare LAMP with PCR for detection of *N. gonorrhoeae*. LAMP has been reported to amplify DNA without any special requirement with high specificity, efficiency and rapidity under isothermal conditions. LAMP assay and PCR were developed with self-designed primers for opa gene separately. LAMP and PCR were standardized by using *N. gonorrhoeae* (ATCC 49226). Serial dilutions of DNA extracted from *N. gonorrhoeae* (ATCC 49226) were used to determine the sensitivity of the assay. Specificity was checked using *N. gonorrhoeae* (ATCC 49226, clinical isolates n=41), N. sicca (ATCC 29193, clinical isolates n=6), *N. meningitidis* (ATCC 13078, clinical isolates n=2), *Escherichia coli* (ATCC 25922), *Staphylococcus aureus* (ATCC 25923), *Pseudomonas aeruginosa* (ATCC 27853), *Streptococcus pyogenes* and *Chlamydia trachomatis*. LAMP was highly specific for *N. gonorrhoeae* showing no cross-reaction. LAMP showed amplification within 30 minutes. Detection limit of LAMP and PCR were 4 fg and 4 pg respectively. LAMP showed concordance (94.4%) with PCR in clinical samples. This LAMP assay offers a highly sensitive and specific assay for the detection and confirmation of *N. gonorrhoeae,* thereby saving time and cost.

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Antilithiatic potential of kidney stone matrix proteins on oxalate injured renal epithelial cells

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Kidney stone disease is a chronic disease and its incidence has been steadily increasing for the past several decades. Proteins are found as to be the major component of kidney stone organic matrix and considered to have a key role in crystal–membrane interaction, crystal growth and stone formation but their exact function in the pathogenesis of the disease still remains obscure. The present study is aimed at examining the antilithiatic potential of proteins isolated from the matrix of human kidney stones. The effect of desalted human kidney stone matrix protein extract was tested on oxalate injured Madin–Darby Canine Kidney (MDCK) renal epithelial cells for their activity. The potential of kidney stone extract was assessed by cell-crystal adhesion study through imaging by phase contrast microscopy. In case of only oxalate(2mM) treated MDCK cells mostly calcium oxalate monohydrate (COM) crystals with sharp edges were observed. A comparatively lesser injury to the cells was there in case of oxalate along withkidney stone protein extract (50 µg/ml) treated cells as mostly calcium oxalate dihydrate (COD) crystals were observed. Although studies have shown that both COM & COD can nucleate and adhere to renal tubular epithelial cells, several lines of evidence have indicated that COM has more potent adhesive capability and can induce more toxic effects to renal tubular epithelial cells. Therefore, we can conclude that the human kidney stone matrix protein extract contains active antilithiatic proteins evincing cytoprotective activity on MDCK cells.

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