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Biosynthesized visible light-activated zinc oxide nanoparticle as bactericidal agent for *Xanthomonas oryzae*



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Background: Synthesis of metal nanoparticles is one of the developed research field because of its primary use in the evolution of new technical areas. Among a variety of nanoparticles, zinc oxide nanoparticles (ZnO) have advantages because of the extraordinary physical and chemical properties. Current effort implied the composition of ZnO nanoparticles with the use of fennel seeds extract and its activity against plant pathogen *Xanthomonas oryzae* that causes bacterial leaf blight disease in Rice plant.

Methods and materials: Zinc oxide nanoparticles were synthesized by a green method using fennel seeds extract (reducing capping agent) and zinc nitrate (precursor). The nanoparticles were further characterized and their photodynamic activation was assessed by quantifying the reactive oxygen species (ROS) by using diphenylisobenzofuran dye. The nanoparticles were then directly applied to *Xanthomonas oryzae* to assess its antibacterial efficacy. Further, the nanoparticle was used to check the efflux pump inhibition of *Xanthomonas oryzae*.

Results: ZnO obtained were distinguished via UV-Visible spectroscopic (360 nm peak), and Transmission electron microscopy reveals the size of NPs (33 nm) and spherical shape. The ZnO synthesized portrayed an MIC (minimum inhibitory concentration) of 40 µg/mL against *Xanthomonas oryzae*. Interestingly, this activity was achieved via the activation of ZnO in visible light thus making them photodynamic with a quantum yield of 0.18, and generating three types of reactive oxygen species (ROS) for instance, singlet oxygen (35.12%), OH ions (30.1%), and OH radicals (34.71%).

Conclusion: It can be concluded that a “nanospray” of this nanoparticle can be a better alternative to the presently available bactericidal agents for bacterial leaf blight disease.

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Are current infection prevention and control expectations fit for purpose? Interim results from an ethnographic study in South India



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Background: Carer involvement around the world has varied impact on infection prevention and control (IPC) practices in hospitals. We investigated the experiences of patients and carers in the surgical pathway of a tertiary hospital in south India, exploring their involvement in IPC and therapeutic decision-making along the patient pathway.

Methods and materials: Ethnographic study through observations from ward rounds, semi-structured interviews, in-depth case studies and documentary analysis. Field notes from observations and interview transcripts were subsequently coded using NVivo and analysed using grounded theory. Data collection and analysis were iterative, recursive and continued until thematic saturation was achieved.

Results: We conducted 48 interviews (44 healthcare professionals, 4 patients), over 100 hours of observations, and 2 in-depth case studies aided by documentary analysis of patient records. Institutional expectations of families are formalised in policies which demand that patients are accompanied by a relative at all times. Such intense presence embeds families in the care environment of the patients, as demonstrated by their high engagement not only in direct personal care (i.e. bathing patients) but also clinical tasks (i.e. wound care), hence playing an important yet implicit IPC role.

The informal carers actively discussed the patient's progress with healthcare workers, received post-discharge advice and, more often than not, decided on therapeutic options on behalf of patients. Such care leadership was assumed and accepted by patients (aware of such involvement in decision-making), healthcare workers and the institution (where policies about additional relatives staying in the ward were routinely ignored), reflecting a culture of communal and collective care.

For patients and relatives, infections were ‘brought in’ by other visitors, resulting in recently discharged patients being kept within the home, where the environment could be controlled and visitors restricted. This approach further highlights the importance of relatives as community carers and gatekeepers of care-related infection.

Conclusion: Applying the current worldwide IPC perspectives focused on patients as sole decision-makers in India may overlook the wider social-cultural context and the constellation of persons who play a role in care and by extension decisions about IPC. Culture-sensitive IPC policy which embrace the roles that informal carers play is urgently needed.

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Poverty and health among CDC plantation labourers in Cameroon: Perceptions, challenges and coping strategies



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Background: Creating better access to good quality healthcare for the poor is a major challenge to development. In this study, we examined inter-linkages between poverty and disease, referred to as poverty-related diseases (PRDs), by investigating how Cameroon Development Corporation (CDC) camp dwellers respond to diseases that adversely affect their health and wellbeing. Living in plantation camps is associated with poverty, overcrowding, poor sanitation and the rapid spread of diseases.