

News from here and there

Opinion is divided among Indian scientists on payment for publication proposal for PhD students

A proposal, issued on 2 February 2019, to pay Indian post-doctoral students who have publications in journals has come under fire from various Indian scientists. The recommendations made by the Murmu committee include stratifying journals of 'repute' by their national and international scope of readership. PhD students with publications in international journals would be paid an amount of ₹50 000. For publications in Indian journals, the amount would reduce to ₹20 000. These one-time incentives for publishing exceed the monthly stipend currently being paid to graduate students and were aimed at improving the quality of doctoral and post-doctoral research in India. The proposal follows models of payment for publication being practised in China, South Korea, Turkey and South Africa.

Indian scientists and academics are critical of such schemes. Degradation of the quality of research undertaken, scientific misconduct, ethical implications and uncertainties regarding government funding of existing programmes have been cited as potential fallouts of implementation of such a proposal. Current data seem to suggest papers by Indian researchers are cited less frequently than those by scientists from China and the USA. Furthermore, papers by Indian scientists are retracted more often than those from scientists in the USA. Creating monetary incentives for publication carries the possibility of large-volume, low-quality research being done simply for financial benefit. Indian academics also pointed out that the disparity in payment between publications in international and domestic journals could potentially imply that articles published in local journals were of inferior quality. As a result, such journals would be expected to attract poorer quality articles and conversely, articles submitted to Indian journals would be reviewed with extreme caution in international journals in the face of incentives being offered for publication. The example of an international reputed journal such as *Science* receiving higher number of articles but having lower acceptance rates of articles from countries such as China and Turkey after they introduced the cash-incentives scheme has been cited to dissuade the Indian government from implementing such a proposal.

Increase in monthly stipends of post-doctoral students, timely payments of said stipends, avoiding delays in payment of grants for research, increased funding for PhD research and increasing the number of permanent scientists in state-funded colleges and research programmes have been suggested as options to improve the quality and scope of Indian scientific research and publications.

MAHARRA HUSSAIN, *United Arab Emirates*

An innovative gastric resident system for delivery of anti-tuberculosis drugs

Tuberculosis (TB) is a global public health problem. Being an infectious disease, TB is curable. With widespread availability of

cartridge-based nucleic acid amplification tests such as Xpert MTB/RIF®, line-probe assays, early diagnosis of TB and anti-TB drug-resistance testing is possible. In India, the Revised National TB Control programme (RNTCP) of the Government of India has made these tests available free-of-cost across the country and 'universal drug-susceptibility testing' is now a reality. TB is curable with administration of anti-TB drug treatment. However, drug-treatment of TB requires daily administration of multiple drugs for a prolonged period of six months or more. Prolonged duration of treatment is one of the reasons for poor drug-compliance which in turn results in the development of multidrug-resistant TB (MDR-TB). So, the quest for newer anti-TB drugs and drug-delivery systems is ongoing.

In this background, a new gastric resident system (GRS) of drug delivery developed by researchers from Massachusetts Institute of Technology (MIT) in the USA is an innovative attempt to facilitate anti-TB drug delivery. In a recently published paper (Verma M, Vishwanath K, Eweje F, Roxhed N, Grant T, Castaneda M, *et al.* A gastric resident drug delivery system for prolonged gram-level dosing of tuberculosis treatment. *Sci Transl Med* 2019;**11** (483).pii:eaau6267. Available at <https://stm.sciencemag.org/content/11/483/eaau6267>), the researchers describe a thin elastic coiled wire an alloy of nickel and titanium (nitinol) as a retainer frame which can change its shape based on temperature. Along the wire, this GRS can hold up to 600 'pills' of drugs enveloped in polymers that can be adjusted to control the drug release rate. The GRS is inserted into the patient's stomach through a nasogastric tube and in the stomach, the wire assumes the form of a coil and further passage into the digestive system is prevented. The GRS can be retrieved later via the nasogastric tube using a magnet which can attract the wire coil. Laboratory testing in pigs demonstrated that this device could result in release of antibiotics at a constant rate over 28 days. The researchers stated that this device could improve patients' adherence to treatment and significantly cut healthcare costs. The researchers had surveyed 111 TB healthcare providers and 300 patients with TB at DOTS clinics and documented that this innovative drug-delivery system was acceptable and feasible in the field setting and reported that this resulted in an estimated savings of more than US\$ 8000 per patient in New Delhi, India. The other conditions where this device could potentially be useful include treatment of hepatitis C and alcohol addiction.

ALLADI MOHAN, *Tirupati, Andhra Pradesh*

Controlled human infection model (CHIM) studies in India

On 6 March 2019, the Health and Humanities Division of St John's Research Institute, Bengaluru, held a workshop to evaluate the feasibility of introducing controlled human infection model (CHIM) studies in India. The meeting was sponsored by the Translational Health Sciences and Technology Institute (THSTI), Faridabad. THSTI is an autonomous institute of the Department of Biotechnology, Government of India (DBT, GOI).

About 30 participants from the fields of epidemiology, community/public health, microbiology, infectious disease, ethics, journalism and law, from public and private institutions and non-governmental organizations from various cities in India attended this meeting.

This meeting was the third such consultation organized by THSTI. The first meeting was held in Vellore in October 2017, and the second meeting in Mumbai in January 2018. The 2019 meeting evaluated the perceptions for the introduction of CHIM studies in India through three specific disease scenarios of public health importance. The diseases that were considered were malaria, typhoid and chikungunya.

In a CHIM study, healthy adult volunteers are given a selected strain of a pathogen at a defined dose via a specific route of administration. The volunteers are cared for and closely monitored for evidence of infection and the symptoms of disease that will develop. It is also used to develop new vaccines for that disease.

CHIM studies have been around for about 70 years. Nearly 45 000 volunteers in the USA and Europe have taken part in such studies. Globally, around 150 CHIM studies have been registered, and more than 600 studies conducted, including those before registration was required.

Reasons for conducting CHIM studies are: to demonstrate microbial pathogenicity, to determine the host factors that contribute to an infection, to describe microbial virulence factors, to evaluate treatment and treatment protocols, to appraise potential vaccine candidates and to consider the efficacy of naturally acquired and vaccine induced responses.

It should be noted that not all CHIM studies are for developing new drugs or vaccines. Some studies are done for a better understanding of the disease process.

Since the microbial pathogen used is a well-characterized mild/attenuated strain, and since these studies are conducted after approval by regulatory bodies, using well-defined protocols, and in specialized facilities, the risk to participants is minimized and the number of adverse effects reported have been few.

Till date, CHIM studies have been used to study an assortment of infectious diseases that include respiratory syncytial virus, influenza, malaria, dengue, cholera, Norovirus and *Cryptosporidium*.

Dr Gagandeep Kang, Executive Director, THSTI, told this correspondent, 'Controlled human infection and challenge studies are one key approach to evaluation of vaccine candidates, and can help in making early decisions about which candidates are worth pursuing. By doing these studies in populations that are exposed to pathogens, we can better predict whether the vaccines we develop are likely to work in the populations that need them.'

P.M. NISCHAL, *Thiruvananthapuram, Kerala*

London and Dusseldorf patients: A ray of hope for HIV cure?

Ten years after Timothy Ray Brown, popularly known as the 'Berlin patient' was declared free of the human immunodeficiency virus (HIV), two successive patients named as the London and Dusseldorf patients (as they wished their identities to be hidden) were declared free of HIV in March 2019. When Brown was declared HIV-free, it was considered as a rare happening but the news of these two patients having been declared free of HIV infection within a span of a month, has generated much interest in the communities suffering from and those treating HIV, about the possible use of bone marrow transplant for HIV.

While Brown and the 'Dusseldorf patient' had acute myeloid leukaemia, the 'London patient' had Hodgkin lymphoma. All three patients also had HIV infection. They underwent stem cell transplants for their haematological malignancies and received bone marrow transplants from patients with a rare homozygous mutation in HIV cofactor CCR5 called as delta 32 mutation. It causes deletion of the 32 base pair and prevents CCR5 expression. As a result, these cells become resistant to HIV variants interacting with CCR5 co-receptor. All the patients underwent total body irradiation. The London patient had been free of disease for 18 months and the Dusseldorf patient for 3.5 months till the time of publication of those cases.

This raises an important question: Can bone marrow transplant offer permanent cure to HIV patients? This correspondent contacted Dr Savita Pahwa, Professor, Microbiology and Immunology (Paediatrics and Medicine), and Director, University of Miami Miller School of Medicine, regarding the importance of these two patients who are claimed to be free of HIV infection. Dr Pahwa explained that these patients were 'important in that they illustrate that HIV cure is possible. However, discontinuation of therapy for prolonged periods without virus rebound and absence of HIV reservoir are criteria for proving virus eradication. The scientific field is opting for achieving functional cure or permanent remission, i.e. even though virus is not fully eradicated there is no evidence of relapse because it is kept in check by the host immune system without need for antiretroviral therapy.' When asked about the practicality and feasibility/non-feasibility of using bone marrow transplants from such donors to cure all patients with HIV infection, she added, 'It is not practical for all patients as it is expensive and risky but is worth attempting in HIV patients who need a stem cell transplant for another reason such as a malignancy.' To a query about the latest ongoing research in terms of achieving HIV cure, Dr Pahwa said 'many strategies are being tried in combination. Delivery of potent monoclonal antibodies has proved to be promising.'

NEHA CHAUHAN, *Bengaluru, Karnataka*
ORCID: 0000-0003-4705-1959