Correspondence

Medical students awareness and motivation for research

In India, a substantial amount of medical research occurs at the postgraduate or post-doctoral level. Early exposure to research helps in the development of critical and analytical thinking, and motivates students to opt for an academic career.[1–3] However, exposing undergraduate students to research is a challenge because of the inadequate number of teachers, researchers, laboratories, funds, etc. Behavioural obstacles, such as poor knowledge and attitudes to scientific methodology, have been observed commonly in diverse settings.[3–5] The involvement of undergraduates as medical research assistants has been shown to enhance publication rates of universities.[6,7] Medical teachers have observed a correlation between higher rank in the admission tests and positive attitudes towards research.[4] Poor participation of undergraduate medical students in research projects is a cause for concern.

In March 2008, we conducted a questionnaire-based survey of undergraduate students in two semesters to ascertain the students' perceptions of research. The questionnaire had 13 questions—5 related to awareness of Indian Council of Medical Research (ICMR) research studentships, 5 to motivation for research and 3 to the role of faculty. The questionnaire was administered to students of fourth and sixth semesters in separate sittings on the same day. Informed consent was obtained from the participants. The responses were anonymous and discussion was discouraged. The responses were evaluated using Microsoft Excel and the proportion of ideal responses by students of the fourth and sixth semesters were compared using chi-square and Student *t*-tests.

Eighty-six students of the fourth semester and 85 students of the sixth semester of the University College of Medical Sciences, Delhi participated in the study. Forty-seven per cent of students were aware of the ICMR studentships and had a low enthusiasm for long term research careers. They perceived a lack of suitable incentives and poor faculty involvement as the main causes for their low enthusiasm. Students of the sixth semester were more aware about the ICMR research studentships ($p=0.04$) but their motivation levels for research were not higher. On the contrary, a higher proportion of students of the fourth semester were willing to do research projects if given credit points ($p=0.02$), and were also more receptive to inclusion of research projects in their curriculum ($p=0.03$). Students of the fourth semester were also significantly more enthusiastic about the faculty making extra efforts to conduct research training ($p=0.03$). Only 6 of the 171 students had participated, or were participating, in ICMR studentships.

Medical education planners[1,3–5,8,9] have always been keen to understand the perceptions of students towards biomedical research. Khan *et al*.[3] from Pakistan did a study that closely resembles our design. Their students had moderate levels of knowledge and attitudes towards health research and these parameters improved with time spent in a medical college. This probably followed efforts to teach research methodology during the first 2 years of their course. In our study, the levels of awareness and motivation were also moderate. From Egypt, Mostafa *et al*.[5] found that their students had high levels of interest and positive attitudes towards research, but many were not aware of the benefits. The main problems perceived by the students in their research were: overload relating to the syllabus, time restriction, inadequate training, lack of guidance, lack of interest and motivation, and lack of incentives. This bears an uncanny similarity to the responses to our questionnaire, albeit in varying proportions. Houlden *et al*.[1] showed that, following a mandatory research elective administered to medical undergraduates, their perceptions of a research career improved and they realized its benefits such as the development of critical appraisal, thinking and information literacy, and in aiding their choice of future careers. This encourages us to believe that our questionnaire may have sensitized our students to these advantages, and we could consolidate these gains with a formally designed research-training module. Another study from Philadelphia[8] emphasizes the importance of students' viewpoints about medical education, as these may vary from commonly held beliefs. Thus, while we presumed that the burden of the curriculum was largely instrumental in preventing students from undertaking research activities, the majority of students had a different reason, namely, lack of incentives coupled with poor input from faculty.

The extent to which admission rank to medical school and other factors influence students' thinking and attitudes have been addressed by some authors. Vodopivec *et al*.[4] showed a positive correlation between higher rank and positive attitudes towards scientific research. Other personal factors (gender, place of schooling or residence) did not have any bearing. Khan *et al*.[3] reported some differences in gender when attitudes were assessed, but no correlation was seen with rank or high school performance. We did not seek information pertaining to the personal or performance parameters of our students.

What medical undergraduates think and opine about research can be used to predict their academic involvement in the future, in the form of postgraduate research interest or a teaching career.[2,6,7,10,11] Altunbas *et al.* from Germany found that involving medical students in formal research projects supervised by faculty resulted in an increased university publication rate.[7] Another means of utilizing young scientific talent would be to enrol undergraduate students as research assistants for institutional-level projects, as was done in Brazil.[6]

It is difficult to generalize the findings of our study done at a single medical college. However, the poor level of participation, as in our centre, is a cause for concern.

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Adventure sports events in India need better medical preparedness

The field of adventure sports is increasing in popularity in India. Given the growing number of sites offering adventure sports throughout the country, more and more people with disposable incomes are flocking to these spots to get an adrenaline rush. However, as evidenced by the recent death of a marine engineer[1] in an accident at a bungee jumping event near Bangalore, the safety standards and state of medical preparedness are still unsatisfactory at these events.

A variety of adventure sports, such as paragliding, white water rafting, high altitude mountaineering, snorkeling, bungee jumping and rappelling, are being promoted at many venues. Supported by tourism departments and often cross-subsidized by government grants, as in Haryana,[2] adventure sports events are organized frequently. Companies send teams of employees to participate in these activities to encourage team-building, leadership and de-stressing, while the training schedules of groups grooming the youth, such as the National Cadet Corps, include adventure sports.

Useful and exciting as they are, adventure sports are also inherently dangerous (which, for many, adds to the thrill factor). Minimum safety precautions, such as the use of helmets in certain events and the presence of a safety net in bungee jumping events, are a prerequisite. (It is alleged that no safety net was in place at the bungee jumping event in which the marine engineer died.) The events should be organized by trained and experienced experts, and the equipment must be checked periodically. A no-objection certificate is also usually required from the local authorities. However, many of those who promote and organize adventure sports events often do not pay heed to the requirements, thus endangering the lives of the participants.

Given the risk element and possibility of injury, it should be mandatory to back up adventure sports events with a medical plan. This should include a pre-event medical check-up by certified medical professionals. First-aid equipment should be accessible, and back-up strategies, such as keeping ambulances on stand-by, need to be put in place, wherever possible. The staff associated with the event should be trained in administering first-aid, as well as stabilizing those involved in accidents so that they are in a condition to be transported to a medical centre. Serious, debilitating injuries and deaths often occur because medical attention is not provided within the 'golden hour' after an accident. Incidentally, delay in providing medical care has also been found to be the main factor responsible for deaths due to cardiac events in India.[3,4] Since adventure sports mishaps often require specialized care, which is not available in smaller towns, the activities should be organized at sites that are close to towns or cities with medical centres that offer such care. Those involved in accidents frequently need to be transferred to hospitals with orthopaedists, neurologists/ neurosurgeons and emergency medicine experts.

The fields of sports medicine and travel medicine, which often deal with accidents and problems that occur in the course of adventure sports activities, are not yet a distinct specialty in India. Usually, only doctors working in the mountainous areas and healthcare providers from the armed forces have experience in dealing with problems such as altitude sickness. Medical students, including postgraduate students, should be given information on the medical complications that can occur in adventure sports and should receive training in how to handle these.

An impediment to the provision of medical care in case of an accident or serious sickness is the fact that many adventure sports events take place on terrain that is treacherous and difficult to access. Hence, advance planning for provision of medical care is a must and medical evacuation strategies are of paramount importance. Also, the organizers of the events should be encouraged to get health insurance for all participants.

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Swine flu outbreak: Dissemination of information

In the era of the Internet, information is just a stone's throw away. In the past, during the severe acute respiratory syndrome (SARS) and avian influenza outbreaks, WHO and Centers for Disease Control and Prevention (CDC) used their websites to disseminate information to a wide audience. The current outbreak of swine flu is akin to the previous outbreaks at least with regard to the requirement of information. While WHO can provide information

on its website, the policy and action plan of each country does not fall within its purview. India must, therefore, devise its own policy and action plan. Information regarding the national strategy such as the establishment of a laboratory network, the preventive measures that need to be taken, information for the general public and updates on the status in India, should be provided through the websites of government organizations such as the Indian Council of Medical Research and National Institute of Communicable Diseases. Dissemination of this information directly to healthcare personnel and the public is important and largely depends on the media. I feel that the web is a powerful means of providing everyone with first-hand information on the real-time situation during outbreaks or epidemics. The widespread dissemination of information will also help prevent confusion among health personnel and panic among the public.

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Oseltamivir (Tamiflu®) for pandemic influenza in India: Some issues

The world is in the throes of a phase 5 influenza A, H1N1 outbreak. At the time of writing this letter, 11 countries are affected.[1] Earlier estimates were that about 25% of the world's population would be affected by the pandemic.[2] Even if the virus were to cause mild symptoms, economic and social disruption arising from sudden surges of illness in so many people occurring almost simultaneously throughout the world would threaten national and international public health, and economic and political security. Oseltamivir (an antiviral) is useful not just for prevention and treatment but would also buy precious time for deployment of vaccines.[3]

While Australia,[4] Canada,[5] the UK[6] and USA[7] built sizeable stockpiles of oseltamivir to cover 25%–50% of their population and decrease clinical attack rates, India had a limited amount. According to newspaper reports, India increased its stockpile to about 3 million courses[8] after phase 4 was declared, but is this enough? The burden of disease could be high in India if the virus hit mega-cities with a high population density, poor health infrastructure and huge slum pockets. Also, other issues besides quantity are important for India.

First, in case of a widespread outbreak, India needs to make educated estimates, similar to those made by other countries,[9–11] about the requirement of oseltamivir both for containing an outbreak at its origin and to decrease the clinical attack rates and severity of disease. The availability of a vaccine will factor in these estimates. Estimates would differ for rural and urban areas. The possibility of multiple foci should be considered. For a good estimate, advance exercises to assess transmissibility to other similar biological agents in various settings will be helpful.

Second, a detailed assessment on procurement needs to be made. The quantity of oseltamivir available from Indian and international companies, the lag period from order to manufacture to delivery at storage sites, and the costs need to be worked out. The active pharmaceutical ingredient of oseltamivir is cheaper than the capsule.

Three, logistics and management of the stock will be critical. There would probably be a need for multiple state/regional stores instead of one national store for speedy delivery to the affected areas and to circumvent the possibility of limited transportation during the pandemic. It is also pertinent to consider if large hospitals should stock oseltamivir, especially in the big cities.[11]

Four, as the pandemic progresses, the virus could acquire resistance. However, it may still be possible to significantly delay and/or reduce the total size of the epidemic.[12] Close monitoring for resistance during the course of a pandemic and a protocol for monitoring of drug resistance should be in place.

Five, a prescription policy needs to be in place for oseltamivir and other antibiotics, including the use of ventilator, etc. There is a need to define the target groups and priority groups, formulate and disseminate guidelines including on the use of syrup, use of capsule powder for mixing with food, weight-wise and age-wise prescriptions, guidelines for the use of oseltamivir with vaccine and to decide whether oseltamivir will be available at retail pharmacies in case of a pandemic. The latter will have huge social implications if the pandemic affects India. Steps also need to be taken to authorize the use of oseltamivir in pregnant women and infants.

Last, and not the least, are the ethical issues. There should be clear guidelines on who receives the limited hospital beds, ventilators, respirators, vaccines or even the attention of overwhelmed hospital staff. The public should be made aware why some will be denied oseltamivir and/or access to healthcare services.[13,14] Ideally, the public should be engaged in this debate.

In a crisis situation, the government is likely to work through expert groups for each of these critical issues. Coordination and management will determine the success or failure of our efforts to contain the pandemic.

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