Effectively communicating the 5R’s (replace, reduce, refine, reuse, and rehabilitate) of research ethics, biomedical waste, personalized medicines and the rest

Effective communication is an essential aspect of growth and success. This is further reflected by the popularity and rapid growth of several web-based tools involved in mass, personal, and professional communications. Nevertheless, voice-based communication has its unique charm as it brings in an emotional aspect and hence greater impact. Just to emphasize on this, there are two educational articles in the current issue which describe in detail on how humans communicate and the understanding of the science behind human voice. Several factors can impair effective communication, which could be irreversible or reversible, and the current advancement in medicine has evolved effective therapeutics to speech acoustic disorders, which are highlighted in the articles in this issue. We also have two interesting articles, which highlight the novel technologies available in the biomedical research and have high potential to advance scientific understanding. One of the articles is on DNA microarray technology, which has several diversified medical and non-medical applications. The other article describes applying mathematics to understand cellular dynamics. Such mathematical application to biological science has potential to seal the wider gap and cater to unmet needs in biomedical research.

Pregnancy is associated with several maternal risk factors and often such risk factors can be passed on to the offsprings. Among these, many risk factors are metabolic and cardiovascular risks which are of high concern from the medical management aspects. We have a very interesting study in this issue which estimated the lipid level changes in pregnant women and observed an increase in HDL levels which the authors conclude as an anti-atherosclerotic protective mechanism. It will be further useful to understand the detailed mechanisms governing such biochemical changes during pregnancy and its direct or indirect implication to the maternal and fetal system. Another article in this issue looks at a closely related topic wherein they have studied the differences in postprandial lipid response among postmenopausal (PoW) than young premenopausal (PrW) women. Interestingly, this study suggests that the nature of lipid postprandial response indicates a higher cardiovascular risk pattern in PoW compared to PrW. Hence, I again emphasize that it is essential to look into the biochemical and metabolic dynamics in various stages of pregnancy to clearly understand the medical and diagnostic implications of such changes to the fetal and maternal system.

The quest to find improved comforts to human life has collaterally resulted in dangerously compromising our ecosystem in terms of environmental pollution, global warming, endangering existing of certain species, and the associated natural calamities. This has triggered several nations (collectively or individually) to adopt measure to avoid any further environmental damage or at least minimize it. Although the major focus has been towards industrial waste, it is essential to look into other minor (but highly potential) environmental threats and one of them being contamination from biomedical waste. An article in this issue highlights on biomedical waste management and it is indeed concerning to note that 25% of biomedical wastes are biohazardous and there is a certain degree of non-compliance in its effective management. It is essential that developing countries bring in strict regulations to manage such waste to avoid any major public health problems. Although education on such waste management is included in undergraduate medical courses, it may be essential to make it a part of continued professional education and strictly implemented with 100% compliance. A closely related issue to biomedical wastes management is the aspects of
occupational hazards and its direct and indirect effects on
the health and safety of the personals involved. In this issue
is an interesting article evaluating the effect of occupational
exposure of dentists to electromagnetic fields on serum
cortisol levels. Interestingly, a decrease in serum cortisol
levels was observed and such decrease in serum cortisol
levels may have significant cardiovascular and immunological
implications. Such occupational hazards among dentists
are similar to radiation exposures among interventional
cardiologists and radiographers, which are increasingly of
concern and may have impact on medical and diagnostic
practices in future. Nevertheless, innovations are necessary
in the medical imaging sector to bring in technology which
can significantly reduce such occupational hazards.

Animal-based toxicity testing has always been intense topic
of discussion among research ethics personals. Such is the
intensity of concern that certain type of toxicity testing
is now banned by several nations. Hence, it is need of
the hour to look into alternatives to animal-based toxicity
testing and identify novel cost-effective bioassays. Hitting
at this bulls eye is an article in this issue validating the
potential of Paramecium-based toxicity assay to be used as
a complementary system to rapidly elucidate the cytototoxic
potential of insecticides. Moreover, the authors report
that their novel bioassay is inexpensive, simple, rapid, and
potential alternative to conventional bioassays. Thus, this
novel assay system addresses a key aspects of 3R’s (replace,
reduce and refine) of in vivo experimental research work
or rather I should mention 5R’s (replace, reduce, refine,
reuse, and rehabilitate). I will highly encourage scientific
researchers to consider improving from the 3R principles
and increasingly adopt 5R principles in their research work
by including the reuse, and rehabilitation concepts. I also
hope that the new Paramecium-based toxicity bioassay
will increasingly find utility in industry and academics in
meeting the 5R principles. Yet another article in this issue
identifies a new concept of using differences in taste
sensitivity to certain chemicals as a means to classify genetic
variability among a population and its direct or indirect
implications on predicting prognosis among various disease
groups. Such economically viable alternatives will not
only be highly valuable in less developed nations where
necessary infrastructure facilities are not available but also
in developed nations where in clinicians can make quick
and reliable diagnostic and therapeutic decisions.

There is considerable interest in personalized medicines as
a means to improve therapeutic efficacy and reduce side/
adverse effects associated with several therapeutics. Its indeed
a challenge to practically achieve 100% personalized medicines
wherein there is one drug for one patient; nevertheless, it is
possible to define patients based on genetic or geographical
profile and achieve a relative degree of personalizing medicine
approach. In this issue we have two articles which although
don’t directly emphasis on personalized medicines but touch
upon concepts which may be useful in practically achieving
the associated concepts. Additionally, the articles emphasize
on understanding the importance of geographical and
epidemiological variations on disease status and progression.
Which I believe is very valuable information in making key
health-related policies wherein diversified health policies may
be required rather than having one policy suits all approach.
Moreover, it is necessary to have policies tuned to geographical
locations with the aim of having realistic plans and the practical
feasibility of successfully implementing them. Nevertheless,
there will always be a component of natural selection within
populations to weed out deleterious genes and preserve the
genres that increase the chances of survival, procreation, and
multiplication as rightly highlighted by one of the articles in
this issue.

In addition to the above highly interesting articles, we have
included in this issue several interesting and rare case reports
which I believe will be very valuable educational tool to our
clinical community. Among these interesting case reports
are A novel and unusual cause of early-onset dementia
by Gliomatosis cerebri involving only right frontal lobe,
clinical diagnosis and management of Pseudotumor cerebri
in a young man developing 4-year post-traumatic brain
injury (TBI), association of acute pure motor reversible
quadriaparesis with dengue fever, Rare innocuous periapical
abscess presenting as angioedema of upper lip associated
with diclofenac sodium use, Isolated cutaneous sarcoidosis
without systemic manifestations, Recurrent hypocalcemia
seizures due to congenital hyperparathyroidism, Peripheral
ossifying fibroma (POF) in the mandibular gingiva, A rare
case of Hunter syndrome, Malignant tumor of maxillary
sinus origin, A sinonasal undifferentiated carcinoma,
and finally a letter to the editor on new paradigms in
the clinical community. Among these interesting case reports
which I believe will be very valuable educational tool to our
in this issue.

I believe as always you will continue to gain from the vast
knowledge available in this issue and I look forward to
your continued support and contribution to our Journal.

Sincerely

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