GeNeDit

# Rare Disorders in India: A New Beginning

## Editorial

Most of the genetic disorders are rare. Though the definition for 'rare disorders' varies in different countries, the basic premise is that they are not common. The other aspect about rare disorders is that most of them do not have curative treatment. Except Down syndrome and beta thalassemia, even the commonest of the genetic disorders like Hemophilia and Duchenne muscular dystrophy have prevalence of about 1 in 5000-10000 live births. Because of their relatively low prevalence, these disorders tend to get ignored by clinicians, the government, researchers and pharmaceutical companies. But the scenario is changing all over the world. The advent of new therapies and a lot of ongoing research suggest hope for many genetic disorders. The Human Genome Project and newer genomic technologies are primarily responsible for this progress. Very rapid identification of causative genes is leading to better understanding of the molecular pathophysiology of genetic disorders and this is a sure step towards the development of novel therapies for these conditions. An article on the genetics of Coffin Siris syndrome in this issue is representative of the research on monogenic disorders in the twenty-first century. Whole exome sequencing can identify the causative gene in a single case or a few cases in a nuclear family. After identifying the first causative gene, other genes in the SWI/SNF chromatin modeling pathway were identified as causes of Coffin Siris syndrome and similar phenotypes. The same strategy is being used in clinical settings for diagnosis of rare syndromes where a clinical diagnosis is next to impossible. The use of exome sequencing for newborn screening is now being explored and early experiences and issues involved in this strategy have been reviewed in the article on NGS-based newborn screening. The GenExpress in this issue gives glimpses of the use of genomic techniques like next generation sequencing and microarray in prenatal diagnosis. The very high sensitivity of diagnosis of fetal aneuploidies, microdeletion syndromes and monogenic disorders like achondroplasia and Duchenne muscular dystrophy through analysis of free fetal DNA in maternal plasma is impressive and a revolution in prenatal diagnosis.

These recent developments in rare disorders are relevant to Indian clinicians and the general population at this juncture, when India is stepping towards being a developed nation. Infectious and nutritional disorders in children are getting controlled. Secondly, medical genetics has taken a strong foothold in India. Though the numbers are still small, state-of-the-art clinical and diagnostic facilities have been established in many centers in India. Due to the large population, even rare disorders are seen in significant numbers in India.

To take advantage of this and to help patients and families with genetic disorders, recently a Workshop for Research in Rare Disorders was organized in New Delhi. The stakeholders in the area discussed various issues and presented the work done in this area. The funding being provided by the governments of some states for free treatment of hemophilias and thalassemia / hemoglobinopathies was acknowledged to be a commendable and important endeavour. These two disorders are the commoner of the genetic disorders and have very good outcome with timely and appropriate treatment. Established patient support groups working for decades for these two disorders have been instrumental in getting government funding for these drugs. This experience will help in future policy decisions and planning for similar government support for other less common genetic conditions as well. The new treatment options are coming and awareness about rare disorders among the policymakers and health administrators created by thalassemia and hemophilias will definitely work in a positive way. In addition to awareness and empathy of clinicians and the government, registries of rare diseases, electronic health records linked to the unique identity, a tiered referral system, population based pilot programs for prevalence studies and a law to

take care of rare diseases are some other actions needed to start work in this direction. Parallel to the patient care activities, research efforts need to be planned in a systematic and planned way as a coordinated effort. The research component for understanding the pathogenesis of various genetic disorders using the vast clinical material in India is one aspect, the other being indigenous drug development as many novel therapies initiated by the developed world are beyond the reach of Indians. All these issues were outlined in the Workshop. I am sure the group will formulate a definite workplan and also will be a mediator to send the correct message and provide guidance to the government. This century is bound to bring a paradigm change in the health policies for rare disorders.

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