



Speeches / Lectures

Inaugural Address at The Royal College of Obstetricians and Gynaecologists (RCOG) World Congress

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Creation is a unique phenomena continuing from birth of the planet earth to all species including human lives.

Friends, I am very happy to participate in the World Congress of The Royal College of Obstetricians and Gynaecologists (RCOG) with over 62 countries represented here. The RCOG as a Knowledge Platform encourages the study and advancement of the science and practice of obstetrics and gynaecology through postgraduate medical education and training development, and the publication of clinical guidelines and reports on aspects of the specialty and service provision. Indian medical experts have emerged as an important group in this world body and I am happy to see them leading in some important areas.

Raising the competency level of our doctors and nurses in this important area and the global opportunities that are there for the Indian young professionals to excel in their careers and take important jobs and positions in the international organizations as well as in the emerging Nations is very important. Upon reflection, I realized that Obstetricians and Gynaecologists are actually the first doctors who deal with the dynamics of human fertilization. They watch like watchful sentinels fertilization occurs and the diploid (two sets of chromosome) chromosome number are re-established, cellular division starts, the process of embryogenesis, and foetal development, how foetus acquire nutrition from mother, organs become fully developed and a child emerges out into the world. There is no branch of science that gets involved in this process. With this background, I have decided to speak today on the topic "**Sentinels of the Creation.**"

Demystifying maternal mortality

Maternal mortality is the health indicator with the greatest disparity between developed and developing countries. India ranks 142 among 176 countries in Maternal Mortality Rate (MMR). Reducing maternal mortality is not just an issue of development, but also an issue of human rights. Preventable maternal mortality occurs where there is a failure to give effect to the rights of women to health, equality and non-discrimination. Preventable maternal mortality also often represents a violation of a woman's right to life. It is seen in India, wherever women education is high, the maternal mortality rate is low. It is true in Kerala and also some north-eastern states in the country.

India has to work and work to see for the 2015 target of a 75% reduction in maternal mortality. There are social and economic factors like the low status of women in communities, the poor understanding of families on when to seek care, a lack of transport, poor roads, the cost of seeking care, multiple referrals to different health

facilities and a delay in life-saving measures in rural areas need to be effectively addressed.

I am told, every two minutes a woman dies of pregnancy-related complications like severe bleeding after childbirth, infections, and high blood pressure during pregnancy and unsafe abortion. Community based surveillance of all pregnant women is a key strategy. A focused public health program can accumulate evidence and help communities understand the root causes behind these deaths so they can take effective, local action and advocate for improved services to prevent future deaths. Women in rural and remote areas can be connected to doctors and nurses in cities through telecommunication and Internet.

Nutrition and maternal mortality

Globally, food insecurity is associated with micronutrient deficiencies, and some form of nutrient deficiency affects an estimated 4.5 billion people worldwide. Of this 4.5 billion, the most vulnerable groups are young children and women of childbearing age. The micronutrients that are most important for maternal and child health outcomes include iron, vitamin B12, folic acid, vitamin D and selenium.

Many of the contributing causes to maternal mortality, such as severe anaemia and short stature leading to obstructed labour, have nutritional links or origins, and these may reach back to before the woman's own birth. Just fewer than half the world's pregnant women have anaemia, with the vast majority from Africa or Asia. The iron-deficiency anaemia causes 18% of maternal mortality worldwide, risking mothers dying from post delivery haemorrhage.

Furthermore, physiological changes in pregnancy lead to an increase in the demand of many nutrients; especially iron, folic acid and zinc." Since most of the women in the developing countries start pregnancy with depleted body stores of these nutrients, their extra requirement of iron and folic acid is even higher than usual. If these needs are not met, the state of anaemia may worsen. Fortunately, anaemia during pregnancy is for the most part, easily prevented and treatable with nutrition, supplementation or fortification.

Relevant interventions range from large national programs, such as those in Nepal where maternal mortality has declined by 67% to local programs or interventions targeted at particular groups of women as in Madhya Pradesh. While some of the potential solutions such as increasing amount and diversity of food during pregnancy and lactation; iron, folic acid and vitamin A supplementation; preventing or treating infections (including malaria and HIV); promoting breastfeeding and building energy stores between pregnancies), seem straightforward there are many other access, contextual, behavioural and system barriers to implementation of nutritional programs for women of reproductive age.

I will now discuss the technology driven expansion of Obstetrics & Gynaecology in to three new areas. These are Reproductive Endocrinology and Infertility, Foetus Development Monitoring and Reproductive Genetics. During my various visits to USA, Canada and Europe, I have been meeting several experts who are working enthusiastically in these areas. We need to bridge these experts with premier Institutions in India.

Reproductive Endocrinology and Infertility

My friend Dr W. Selvamurthy used to share with me insights into Psychology-physiology-environment interaction, when we were working in DRDO. He was the Chief of Defence Institute of Physiology & Allied Sciences. He explained to me, one such interaction about the hypothalamic-pituitary-gonadal axis (HPG axis). Because these glands often behave in cooperation, physiologists and endocrinologists find it convenient and descriptive to speak of them as a single system.

The hypothalamic-pituitary-gonadal axis is a critical part in the development and regulation of a number of the body's systems, such as the reproductive and immune systems. Fluctuations in the hormones cause changes in the hormones produced by each gland and have various widespread and local effects on the body.

As all of you are OBG Experts here know, one of the most important functions of the HPG axis is to regulate reproduction by controlling the uterine and ovarian cycles. In females, the positive feedback loop between estrogen and luteinizing hormone help to prepare the follicle in the ovary and the uterus for ovulation and implantation. In males, the production of GnRH, LH, and FSH are similar, but the effects of these hormones are different.

Reproductive endocrinology and infertility (REI) is a surgical subspecialty of obstetrics and gynecology that trains physicians in reproductive medicine addressing hormonal functioning as it pertains to reproduction as well as the issue of infertility. While most REI specialists primarily focus on the treatment of infertility, reproductive endocrinologists are trained to also evaluate and treat hormonal dysfunctions in females and males outside of infertility.

SARA

Dr. Curtis Lowery, who is the Chief of maternal foetal medicine at the University of Arkansas for Medical Sciences, USA. He has been working on SARA - Squid Array Reproduction Assessment. Dr Lowery described the device, which monitors foetal development, as a "super conducting quantum interference device" that uses expensive liquid helium to create extreme cold necessary for its operation.

Dr Lowery use this device to check fetal heart and brain development and detect false labours using 151 pickup coils, or antennas, to measure magnetic fluctuations in biological tissue, Lowery said. Data collected is rendered as charts, graphs and colour shifts or changes. It can detect abnormalities and structural problems in foetal brains and hearts, such as a restriction of oxygen flow to the brain, and gives doctors better information for pregnancy management. It's been used to detect developmental differences between twins. "There is a lot more information than off of traditional electrical signals and a lot more depth to the information," Lowery said. "You can probe deeper into tissue, which is perfect for a foetus because it is deep within a mother."

Reprogenetics

On January 22, this year, I addressed the 39th Annual Meeting of Indian Society for Human Genetics and International Conference of Human Genetics at Ahmedabad. My host, Dr Jayesh Sheth and his wife Dr Frenny Sheth have established the Foundation for Research in Genetics and Endocrinology (FRIGE) and have been doing important work in

the field of Genetics and Endocrinology. This is the self-financed foundation and its income comes from the training programme/conferences/symposia held by FRIGE and partly from the Genetics centre where they offer diagnostic and counselling services.

I learnt from Dr.Sheth that genetics is not only about forecasting; it is about knowing the reasons behind our present existence and a quest about how to mitigate the negative outcomes in distant future by acting now. I also learnt, how low protein diet, low Vitamin B12 and other gene-nutritional interaction is more likely for the error which occurs in chromosome transfer during pregnancy and how birth of a healthy child can be ensured by taking good care of the pregnant mother.

Reprogenetics is emerging as a new field in medicine out of the merging of reproductive and genetic technologies. It is now possible to interpret the effects of different expressions of DNA, the ability to harvest large numbers of embryos from females, and a far higher rate of reinsertion of embryos into host mothers. This field holds great promise in eliminating disease genes passed on to children.

Gene therapy is a promising new field of medical research. Researchers try to supply copies of healthy genes to cells with variant or missing genes so that the "good" genes will take over the physiological function. Viruses are often used to carry the healthy genes into the targeted cells because many viruses can insert their own DNA into targeted cells. But there are problems with gene therapy. Unlike in plants, scientists still do not quite know what every gene in the human body does. Huge scientific efforts like The Human Genome Project and related projects have completed mapping of the entire human genome. But it will take many more years to find out what each gene does and how they interact with one another. Probably, you experts can contribute to accelerate the pace of the work.

For most diseases, scientists do not know whether and how genes play a role. Also, there are major difficulties in inserting the normal genes into the proper cells without causing problems for the rest of the body. The concept of gene therapy has been around for 25 years but we are not advancing beyond adding copies of genes that are defective. We must insert a corrected copy of the gene exactly where it should be. That means, it is properly controlled and switched "on" and "off" as it should be.

During my recent visit at LV Prasad Eye Institute, Hyderabad, my friend Professor D Balasubramanian explained to me the new technique, called genome editing. In this new type of genetic engineering, DNA is inserted, replaced or removed from a genome using artificially engineered nucleases, or "molecular scissors." It holds promise against a group of illnesses that run in families and are caused by faults in genes that underpin the healthy working of the immune system, bone marrow and liver.

Modelling the Future Workforce of Obstetrics and Gynaecology

There is a growing demand for educating future physicians to be socially responsible. There is a growing public sentiment that doctors be "held to account by society" if they do not demonstrate that their education, research, and service activities are preparing future physicians with the capacity to respond to the "priority health concerns of the community, region, and nation they have a mandate to serve.

The quest for social responsibility and accountability is a long-standing attempt toward defining, energizing, protecting, and upholding the social contract between medicine and society. It is an agreement that the medical profession will receive certain rights and privileges in exchange for service to society and the public good.

The most challenging problem of human civilization right now is that science is gathering knowledge faster than society is gathering the wisdom. Since the time of Hippocrates, the history of medicine has been one of ever more sophisticated phenotyping: these are the signs of diabetes; those, the symptoms of Alzheimer disease. Medicine's ability to understand and treat disease has hinged on this careful phenotyping of patients.

Modern genetics now has historic opportunity to complete the symmetry of this equation by bringing genotyping to the traditionally phenotypic endeavour of clinical medicine. And while the complexity of this information is a barrier to its implementation, medical geneticists and genetic counsellors are well positioned to deal with this emerging volume of information, ensuring our relevance to medical practice.

You also bear the additional burden of safeguarding ethics and moral values surrounding the work done outside our country. From sequence analysis to microarrays, unprecedented amounts of medical information are being generated which will soon directly pertain to patient care. It is high time that medical geneticists demonstrate to clinicians and policy makers that their activities are necessary to patient care and genetics must emerge as part of medicine's mainstream.

At the same time, there must be a realistic response to the pull toward the private interests of professionals. Similar concerns have emerged in other health care disciplines, like nursing and paramedics. Within the context of society's priority health needs, medical education and practice need to be particularly sensitive to the social determinants of health and to the health care needs of people who are vulnerable and marginalized. Also we need to pay to nurses and paramedics well. There is an unacceptable disparity in how much a doctor and a nurse earns in India. I am sure world organizations like The Royal College of Obstetricians and Gynaecologists (RCOG) are aware of it and they will take up this important task of rationalizing adequate wages to nurses and paramedics who play no lesser role in serving the patients, particularly more in your discipline.

Conclusion

Friends, I will conclude with the words of German doctor Rudolf Carl Virchow, known for his advancement of public health. He said, "*Medicine is a social science, and politics is nothing else but medicine on a large scale. Medicine, as a social science, as the science of human beings, has the obligation to point out problems and to attempt their theoretical solution: the politician, the practical anthropologist, must find the answers for their actual solution?.* **The physicians are the natural attorneys of the poor, and social problems fall to a large extent within their jurisdiction.**"

I wish The Royal College of Obstetricians and Gynaecologists (RCOG) World Congress a great success.

May God bless you!

By Dr. APJ Abdulkalam

