Review Article

Indian Journal of Trauma and Emergency Pediatrics
Volume 7 Number 3-4, July - December 2015

Medical Education in India

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Abstract

Not Provided

History of Medicine in India

Pre- Vedic period from 3000BC- Evidence of anatomic knowledge on cave paintings in Indus valley [1].Vedic period (around 1500BC)- marked by writing of four Vedas, or sciences (describe the aspects of anatomy, medicinal herbs and plants).Post- Vedic period (800BC-1000AD)- golden age of Indian medicine (documented by writings of Charaka and Sushruta)[2] in form of Ayurveda and Siddha system. 13th century- Unani system of medicine was introduced by Muslim rulers.From 1810 Homeopathy gained foothold in India till the advent of British in 18th century. Western medicine- introduced by Portuguese in Goa (1840), started the Medicine and Pharmacy Licentiates (Goa Medical College).British established Madras Medical School in 1835.University affiliated medical education (1850s) - after opening of first 3 Indian universities in Chennai, Mumbai, and Kolkata.

- 1946- Bhore committee- Recommended major changes in medical education- 3 month's training in PSM to prepare "SOCIAL PHYSICIAN"
- 1975- Srivastava committee- Group on Medical Education and Support Manpower, Family and community oriented practitioner with social responsibility.
- Advocated and recommended reorientation of medical education according to national needs through a medical education commission on lines of UGC.

Medical Council of India

A governmental agency under the Ministry of Health and Family Welfare (1934).Indian Medical Council act 1956 is operational today.It was amended

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in 1956, 1964, 1993& 2001.Statutory recommending body.It stipulates the rules for medical school curriculum, structure and content.

- 1977- Reorientation of Medical Education (ROME) scheme was launched to link community based facilities with medical colleges.
- 1983- National health policy provided directions to reconstruct the curriculum (train Undergraduate medical students as a Primary care physician).
- 1986- Bajaj committee report- emphasized on need of a Medical and Health Commission.
- In 1992- the National Institute of Health and Family Welfare carried out a study on the effectiveness of the training given in the graduate course on issues relating to Maternal and Child Health and Family Planning.
- In the same year MCI organized a National Workshop for debating a Need based Curriculum for UG Medical education
- 1997- GoI on recommendation of MCI promulgated the "Regulations on Graduate Medical Education" through a gazette notification.
- In 2011 the Board of Governors of MCI had announced a fresh set of curricular changes entitled 'Vision 2015' to re-look at the various aspects of medical education, training and practice for the country

Medical Colleges in India:

Total number:

1947	1965	1980	1990	2006	2014
23	86	112	143	262	395

Private and Government Medical Colleges:

	1995	2006	2014
Private	47	131	214
Government	109	131	181

2014

Total MBBS seats- 49530

- Government colleges- 181, Seats- 24610
- Private colleges- 214 , Seats- 24920

MD/MS/Diploma

- Government seats- 13913
- Private seats- 8387

Reasons of Current Downhill

The medical education system in India may be on the verge of collapse.

1. An exploding number of medical colleges
2. A skewed distribution of these around the country
3. Devaluation of merit in admissions, particularly in private institutions; increasing capitation fees admission of suboptimal quality of students with poor motivation
4. An alarming shortage of teachers, with those who exist being untrained in modern teaching–learning technology.
5. Gross shortage of patients in many institutions.
6. A less than desirable evaluation system and poor internship supervision.
7. The curriculum is outdated, insensitive to modern concepts of the process of teaching–learning, rigid and discourages innovation.

Recommendations in Vision 2015

- Increasing seats of PG diplomas and degrees.
- Building competency based modules.
- Change of Nomenclature and introduction of M. Med Course - 2 year Master of Medicine (M. Med) program as the first level of specialists with focus on skill development and providing care to community.
- Career Pathways after M. Med.: Degree Course
  - i. A two year course on allied subjects
  - ii. A three year research path would lead to the MD / Ph.D degree on completion of requirements
- Fellowship programs
- Need based Assessment & Distribution of Diplomas and PG Courses.
- Training & Assessment- Extensive faculty development Training, Continuous formal structured assessment, a doctoral committee in every institute will constantly monitor the training of these students, Establishment of skill labs would be mandatory and Maintenance of log book.
- Rural Service criteria for entry in postgraduate courses.

Challenges in Medical Education

- Rapid and uneven growth of Medical school.

- Validity of student selection policies is questionable
- Curriculum goals are weakly focussed on health care needs with deficiency in internship year
- Lack of faculty development to meet the needs of expanding number of medical schools.

Challenges to Dental Education in India:

- The challenge of selecting students passionate enough to pursue dentistry.
- The challenge of bridging the theory - application gap:
- The challenge of having adequate number of competent faculty.
- The challenge of delivering oral care for the masses.
- The challenge of ensuring ethical dental practice in the country.
- The challenge of ensuring the quality of dental graduates practicing in the country.
- The challenge of suitable employment for graduate dental surgeon.

Reciprocal Selection of Students and Profession

- In India, medical students are selected on the basis of pre-medical tests (PMTs), held by each state for its residents. The tests, which take place once a year and are open to those who have graduated from high school, consist of multiple-choice questions (MCQs) covering physics, biology and chemistry.
- There is also a national examination which allows students from one state to apply for admission in another. About 85% of admissions are made on the basis of the tests administered by the states, while 15% are made on the basis of the 'all-India' entrance test.
- There are two issues involved here: selection of the profession by the students and selection of students by medical colleges.

Medical Training

- Teaching is based mainly on the traditional didactic pedagogic method and case discussions during clinical postings. The lack of coordinated teaching hampers learning to some extent.
- The inclusion of the relevant radiological and laboratory findings of the diseases under discussion could help to develop a systematic scheme by which the students could evaluate the results by themselves.
- Since students are exposed to these investigative modalities during their rotations through these specialties, they would be able to participate actively in the discussions making the learning experience more effective than one characterized by didactic lectures.
- Vertical integration is another method that is increasingly being introduced with classes on relevant pre- and Para- clinical topics during a clinical rotation being held independent of the clinical classes.
- Coordinated teaching can be introduced as early as the first year, with the same systems being covered under all three subjects during the same period—'horizontal integration'. Early community-based training for longitudinal clinical experiences.
- Community experiences contribute positively to the education, critical thinking and problem-solving skills of students. Value early clinical experiences, which help them acquire important clinical skills and knowledge.

Evaluation

- The focus of evaluation should also shift to the practical aspects.
- Students need to be assessed continuously for an evaluation of their interest and involvement in healthcare, and provided feedback regarding the same.
- The frequency of tests also needs to be reduced to the minimum to reduce stress and facilitate training.
- It would also be useful to replace the traditional long-/short-case examinations with more valid and reliable instruments for the assessment of clinical skills, such as objectively structured clinical examination (OSCE).
- Subjective assessment of knowledge by the faculty has been shown to correlate only weakly with objective performance
- It would be useful to adopt a system similar to the United States Medical License Examination (USMLE), which assesses the student's ability to apply his knowledge in three parts:

Step 1 for pre- and Para-clinical fundamentals

Step 2 for clinical knowledge and skills

Step 3 for comprehensive evaluation of case management ability.

- Systematic and reliable programmes for evaluation are a must to prevent curricular changes from drifting away from the intended path.
- It is imperative to revise the evaluation methods to permit other changes to be made without increasing the stress on students. Evidence-based medicine should be emphasized throughout.
- The training. The aim should be to stimulate the student to independently explore and assess various modalities of investigation or management in terms of their relative merits or demerits.
- It is mandatory for students to have publications to their credit before they can apply for the final degree.
- Students should be encouraged to attend workshops and seminars as these help them remain up-to-date with the current developments and expose them to potential areas of research.
- Students should be provided incentives, including financial ones, to undertake research.
- Programmes such as the 'Short-term studentship' of the Indian Council of Medical Research are a step in this direction.
- Programmes in which a student can choose a preceptor or a mentor under whose supervision he can do clinical rotations.
- By choosing a preceptor, a student is able to obtain better exposure to various specialties of interest, which can later help her/him make informed decisions regarding specialization

Faculty Development and Accreditation

- Any reform should begin with the systematic development of medical educators, The MCI has recommended the establishment of medical education units/departments in all medical colleges.
- These units can be utilized for the development of the faculty and for the provision of learning resource material to teachers.
- The development of faculty for medical education in India has been supported by the Foundation for Advancement of International Medical Education and Research (FAIMER), USA. This is a non-profit foundation designed to support programmes and research that improve medical education and healthcare worldwide.
- The term 'accreditation' can be defined as a process by which a designated authority reviews and evaluates an educational institution, using a set of clearly defined criteria and procedures.
- Despite these variations, India has a well-established policy on quality assurance of medical education.
- Mandatory accreditation is conducted by the MCI. As an outcome of the recommendations of the National Policy in Education, an autonomous body called the National Assessment and Accreditation Council (NAAC) was established in 1994.
- Accreditation of medical colleges by the MCI is compulsory, but the requested information emphasizes documentation of infrastructure and human resources rather than measures of the quality of medical education and outcome.

Recommendations

- Uniformity of basic level of competencies across the country and uniform standard for Indian Medical Graduates.
- Integrated curriculum
- More attention on development of various skills, viz., problem solving skills, psychomotor or performance skills, attitudinal and communicational skills
- Changing the schedule of PG Entrance.
- Introduction of evaluation at the end of internship
- Rationalize the examination system of medical students- assessment should be criterion-referenced and based on the core curriculum.
- Adoption of practice of Evidence Based Medicine**.**

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Case Report

Indian Journal of Trauma and Emergency Pediatrics
Volume 7 Number 3-4, July - December 2015

A Rare Case of Meckel Gruber Syndrome

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Abstract

Meckel-Gruber syndrome, also known as 'Dysencephalia splanchnocystica', is a rare lethal autosomal recessive disorder consisting of central nervous system malformation- mainly posterior encephalocele (80%), multicystic kidneys (95%) and polydactyly (75%). Besides the classic triad of neural tube defects, polydactyly and cystic dysplasia of the kidneys, other abnormalities can occur in association with the syndrome, which may be detected sonographically include micrognathia, cardiac abnormalities, syndactyly, clinodactyly and clubbed foot. The worldwide incidence varies from 1 in 13,250 to 1 in 140,000 live births. Highest incidence was reported in Gujarati Indians.We report a case of a 26-year-old woman with previous LSCS referred from a private practitioner with abnormal ultrasonographic findings. She was diagnosed to have Meckel-Gruber syndrome. Woman and her husband were counseled regarding this lethal condition incompatible with life and after proper consent and information, pregnancy was terminated.

Keywords: Meckel-Gruber Syndrome; Encephalocele; Polydactyly; Cystic Kidneys.

Introduction

MKS was first described by Johann Friedrich Meckel in 1822 in two siblings who died of identical malformations of occipital encephalocele, polycystic kidneys, and polydactyly. George B Gruber, in 1934, reported many familial cases with similar features and coined the term "dysencephalia splanchnocystica [1, 2].

It is a lethal autosomal recessive disease with gene locus mapped to chromosome 17q21-q24[2] . The MGS is characterized by triad of features having occipital encephalocele, cystic kidneys and polydactyl [3,4,5,6,7,8]. The incidence of this rare syndrome is 1 per 1 300 live births in Gujarati Indian families,1 per 3 000 in Belgium, and 1 in 9 000 in Finland. The disease affects all races with males and females being equally affected. Once diagnosed, the chances of MKS in subsequent pregnancy are 1 in 4 (25%). The diagnostic criteria for MKS is presence of at least two of the three classic features like cystic renal dysplasia, occipital encephalocele, and polydactyly, which are observed in 100%, 90%, and 83.3%, respectively.[1–3] As observed in our cases, our case number 1 showed minute cyst in the kidney on microscopic examination, indicating the need of neonatal autopsy in syndrome diagnosiIt has wide phenotypic variations showing abnormalities of lip, palate, eye, ductal plates of the liver, cardiovascular and genital systems [3,5,7,8]. Other variants described include MKS2 in the Middle East and Northern African families, and recently MKS3 [1]. A high incidence of MKS has been reported in Gujarati Indians [3].

We report on a MGS diagnosed in the 2nd trimester antenatal ultra sonogram examination and subsequently confirmed in the abortus for its rarity

Case Report

A 26-year-old primigravida presented with 19 weeks of gestation for routine antenatal examination. There was history of second-degree consanguineous marriage. Past and family histories were noncontributory. She was not on any teratogenic drugs. Routine antenatal scan done showed features of anencephaly.

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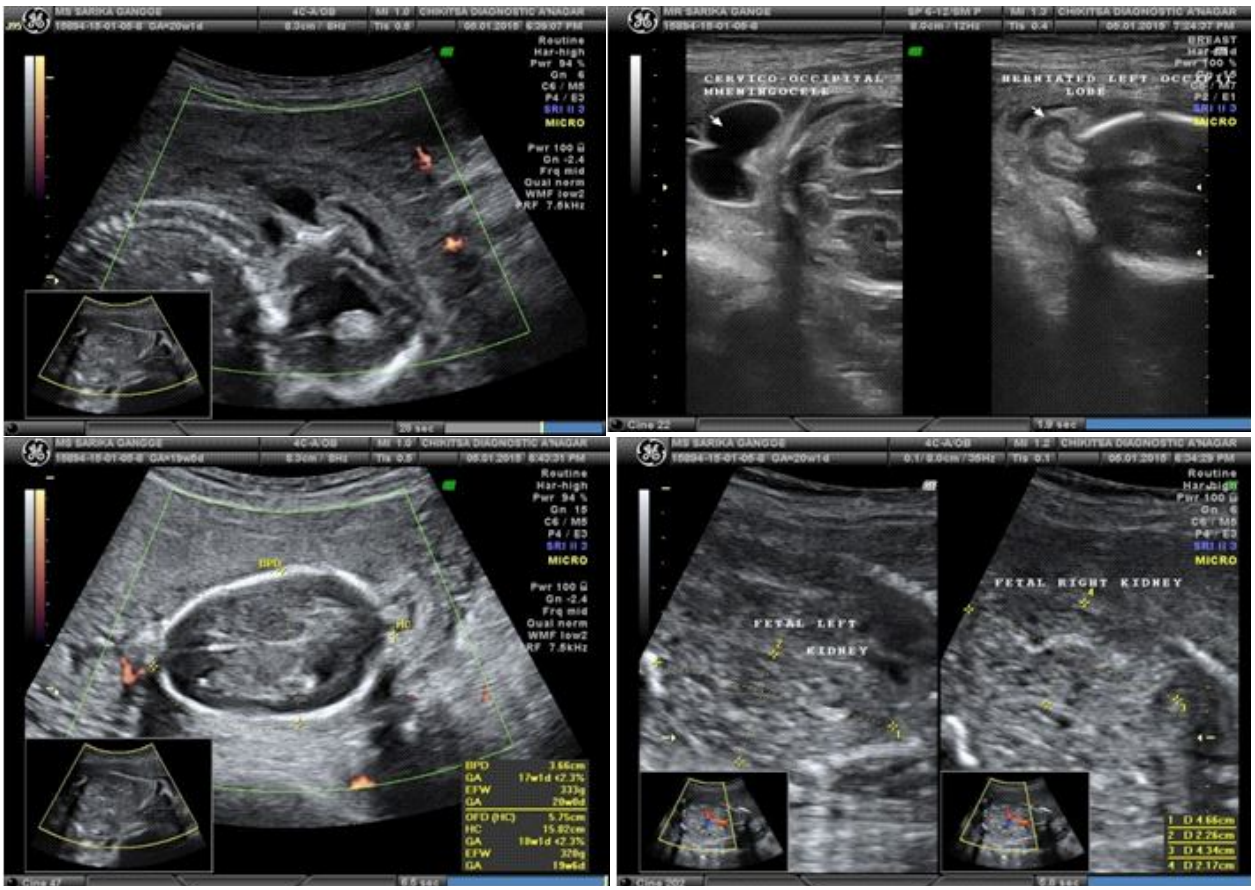

Fig. 1,2,3,4: Anetenatal scan

Fig. 5: Ventral surface of fetus showing encephalocele

Fig. 6: Gross features of Polycystic kidney

Ultrasound scan, done at 15 weeks gestation revealed encephalocele. Detailed ultrasound scan was repeated at 24 weeks gestation which confirmed posterior encephalocele, bilateral cystic kidneys, talipes, and polydactyly. The possibility of MGS was raised, the natural course and the prognosis was explained to the parents who opted to terminate the pregnancy. Following further extensive genetic counseling and approval of the hospital ethics committee, termination of pregnancy was carried out at 25 weeks gestation. The baby was born alive but gasping and died in 15 minutes, no resuscitation was

offered.he birth weight was 1 kg, length was 32cm, and head circumference was 20cm all <3rd centile. Clinical examination revealed occipital encephalocele, microcephaly, cleft palate, post axial polydactyly, bilateral talipes, short limbs, and grossly enlarged abdomen with bilaterally palpable kidneys (Figures 1 and 2). The genitalia were undetermined with 1 cm phallus with a single opening, labioscrotal folds and no palpable inguinal mass. Chromosomal analysis of the baby revealed 46 XY karyotype. Further detailed DNA study was not available.

Discussion

Meckel-gruber syndrome (MGS) is otherwise called as Dysencephalia splanchnocystica [9]. It was first described byJohann Friedrick Meckel and it is a rare autosomal recessive lethal disorder.

The incidence worldwide has been reported as 1:13,250 to 1:140,000[10]. Finnish and Gujarati Indians show an increased incidence of this condition [11].

Meckel-gruber syndrome is characterized by occipital myeloencephalocele, bilateral renal cystic dysplasia, hepatic ductal proliferation, fibrosis and cysts, and polydactyly[11]. But the characteristic clinical triad consists of occipital encephalocele, polycystic kidneys and postaxial polydactyly. At least two of these features are essential for the diagnosis. Microcephaly, cleft palate and ambiguous genitalia may also be present in Meckel-gruber syndrome [13].

Meckel-gruber syndrome can be diagnosed prenatally by ultrasound findings at 11 to 14 weeks of gestational age. Alfa fetoprotein can also be measured in the maternal serum but it is not elevated when the encephalocele contain a closed sac [14].

It can occur following artificial insemination like in vitro fertilization. Celentano et al reported a case of MGS diagnosed at 17 weeks in a pregnancy obtained with intracytoplasmic sperm injection (ICSI) [15]. Three genes (MKS1, MKS2 and MKS3) have been identified. MKS1 located on chromosome 17q, MKS2 is on chromosome 11q and MKS3 is on chromosome 8q or 13 q. Locus heterogeneity is a feature of Meckel-gruber syndrome since the presence of phenotype variability [16].

This case report highlights the importance of antenatal scan in diagnosis of inherited diseases such as MGS. This helps physicians and parents to plan further management of pregnancy. Following extensive genetic counseling the parents opted to terminate this pregnancy. Termination of pregnancy raises complex ethical, legal, social and religious issues. As MGS is not compatible with life, the opinion of parents was adhered to. In cases of unborn babies affected by conditions leading to developmental delay and other morbidities which are not lethal, termination of pregnancy is generally not indicated.

Recently, primary prevention of genetic diseases became a reality by introduction of preimplantation genetic diagnosis (PGD) [15- 16]. In order to help families to make use of PGD, physicians need to confirm the diagnosis of the genetic disease at the DNA level in the index case. We were unable to perform mutation analysis for our patient because of lack of facilities. It was a missed opportunity to prevent possible recurrence of MGD for the third time in this unfortunate family.

Conclusion

In Meckel Gruber syndrome most infants are still born or die within few hours or days after birth. Review of literature reveals only ten neonates surviving beyond birth.

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