Indian Journal of Emergency Medicine

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INDIAN JOURNAL OF EMERGENCY MEDICINE

VOL. 1 NO.1 JANUARY - JUNE 2015

CONTENTS

Indian Journal of Emergency Medicine
Volume 1 Number 1 January - June 2015

INDIAN JOURNAL OF EMERGENCY MEDICINE
A NEW JOURNAL IN INDIA

I have pleasure to welcome all to the inaugural issue of our new journal publication "**Indian Journal of Emergency Medicine (IJEM)**" launched on the auspicious day of 26th of Jan 2015 (Republic Day of India).

Over the last decade, Emergency Medicine has developed in India in a very fast pace with several well equipped Emergency Departments of international standards. With DNB and several other academic programs in Emergency Medicine, that has started in India, and lot of academic research has been done in India on Emergency Medicine already. However, most of these high class research works of India either get published in a western journal, mostly in non EM ones, or land in the recycle bin to be deleted on a later date.

As editor, the first task was to determine why, exactly, we needed a new journal in Emergency Medicine. The following is surprisingly the current data on journals worldwide that answers to the above. Of the 4000 plus journals listed in *Index Medicus*, there are only 27 journal are in Emergency Medicine. Of these, more than 30% deals with specific subspecialty areas like Disaster Medicine, Prehospital Care and Paediatric Emergency Medicine. There are no EM journals from India in the above list. Of the non indexed journals in Emergency Medicine, India have only two true EM journals. Thus, we felt that the EM physicians of our vast country with wide scope and diversity should have publications in an Indian Journal to show the world the good work that we are doing.

So, we decided that IJEM should be a truly Indian journal in Emergency Medicine to develop high quality academic Emergency Medicine in India. Just as the country and its people, the journal would be filled with diversity, politeness and humour, yet highly scientific — a journal that publishes Emergency Medicine issues from the Indian standpoint.

Though the contribution of India to the world literature in Emergency Medicine is very high, yet a lot of work is not recognised because of lack of facility to publish. Our emergency medicine scholars deserve more recognition than they receive. So, it's time now to have the option of publishing in India and to share the Indian EM experience with the world beyond. That is why; we need an Indian journal of Emergency Medicine.

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Indian Journal of Emergency Medicine
Volume 1 Number 1 January - June 2015

PERCEPTION OF EMERGENCY MEDICINE BY CONSULTANTS OF OTHER SPECIALITIES IN KOLKATA-INDIA

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ABSTRACT

Background: Emergency Medicine is an emerging specialty in the Indian medical scenario. Our study, which is first in India and second worldwide, assessed the perception of other specialties regarding the present status, purpose and the future of Emergency Care in India. **Method:** A multicentre, questionnaire based survey was conducted amongst 106 randomly selected consultants from other specialties in four tertiary care hospitals in Kolkata, India. **Results:** 97.17% of respondents felt that the official term for the specialty should be "Emergency Medicine" (40.57%) OR "Emergency Medicine & Accident /Trauma Care" (56.60%). 93.40% of the participants perceived that at least 1 Emergency Physician per shift, registrars and 12 beds would be needed for a "fully equipped ED". 85.05% and 51.72% of the respondents felt that Resuscitation and Rapid sequence intubation should be done by Emergency physicians. Most of the respondents (96%) felt that ED physician(s) had excellent resuscitation skills. Most of the respondents (90%) felt that emergency medicine has an excellent future as an independent specialty. **Conclusion:** The principal finding our study is that Emergency Medicine, as a specialty in India, is accepted by other departments. The expectations are high and there are potential areas with significant scope of improvement. The perceived purposes and strengths provide a focus on proper training and development of Emergency Medicine, while opinions on new practices and weaknesses indicate scope of improvement. The results can contribute to decision-making for structuring proper Emergency Departments. Further similar studies on a wider scale involving other parts of India need to be done to ensure generelizability of the results.

KEYWORDS:

Emergency Medicine.

INTRODUCTION

Emergency Medicine is a relatively new speciality in India and is still being accepted on a wider scale. Although the specialty is practiced in many western countries for several years Emergency Medicine still remains in its infancy in India and there remain certain uncertainties regarding its future.[1,2,3] Emergency Medicine (EM) is a medical speciality dedicated to the prompt diagnosis and treatment of unforeseen illness or injury.[1,4,5] The practice of EM includes the initial evaluation, diagnosis, treatment, and disposition of any patient requiring expeditious medical, surgical, or psychiatric care. In doing so, the Emergency Department has to communicate and liaison with a large number of departments and specialties. It is therefore important and necessary for Emergency Physicians to be aware of the views of hospital colleagues.

The purpose of our study was to try and understand how this new specialty in India is perceived by consultants from other specialties - specifically their understanding and expectations from Emergency Medicine. The study also tried to evaluate level of satisfaction with present standard of Emergency Care and their perception regarding the future of emergency medicine in India.

MATERIALS AND METHODS

Study design

This study was a multicentre questionnaire based survey to find out how Emergency Medicine and the Emergency Department is perceived by consultants from other hospital specialties in terms of its growth and acceptance as a specialty. The study also evaluated the respondent's expectations and satisfaction with their local Emergency Department care and the scopes for further developments.

The questions were formulated from the College of Emergency Medicine's ''Definitions of the Emergency Physician''[5] and a previous study on the Perception of Emergency medicine by consultants and registrars of other specialties done by Reid *et al* (2009)[4] in United Kingdom. Likert – type scale or tick boxes were mostly used to answer the questions. A box for comments was left at the end for any additional comments.

The questionnaire covered the following:

1. General views such as purpose and need of specialty of Emergency Medicine
2. Satisfaction level with current practice of their hospital ED.
3. Future of Emergency Medicine in our healthcare system.

A pilot study with test-retest method was conducted to validate the questionnaire. Ethical considerations at every stage of a research process, including the choice of topic to research, was discussed with the Research Ethics Committee of Peerless Hospital and B.K. Roy Research Centre, Kolkata of the hospital. No names were attached to the data collection form, to allow for participant anonymity. Confidentiality of data gathered from participants was respected at all times.

Inclusion Criteria

- Non EM working in Multispecialty hospitals in the position of Consultants only.
- Possess PG degrees/fellowships in their relevant fields.
- Hospitals with an Emergency Department(ED) recognized by Society Of Emergency Medicine in India (SEMI) were only included.

Exclusion Criteria

- Doctors doing general practice (GP)
- Consultants working in hospitals with no ED.

Study setting and method of data collection

The study was conducted between March 2012 and December 2013 on 106 randomly selected Consultants from four tertiary care hospitals of Kolkata. All these hospitals have a fully functional Emergency Departments that are accredited by the Society of Emergency Medicine in India (SEMI). The questionnaire was completed by the Consultants in one to one interviews with the principal investigator and the replies were kept anonymous.

RESULTS AND DISCUSSION

A total of 106 completed questionnaires were received from the participants. 27 of the respondents were females and the rest 79 were males. Most of the respondents were > 36 years of age (n 72). The proportion of respondents from each specialty in the study is given in the table below:

Sl. No.	Specialty	No. of Doctors
1	General Medicine	20
2	Orthopaedics	15
3	Respiratory Medicine	4
4	Anaesthetists	21
5	Cardiology	4
6	Neurology	6
7	Nephrology	1
8	ENT	5
9	General Surgery	6
10	Critical Care	24
11	Radiology	5

The responses were analysed under the following headings to assess the perception among our colleagues regarding Emergency Medicine as a

specialty, their opinion regarding structure and function of an ideal department, satisfaction level with reference to the Emergency Department(s) in their hospital and what they thought about future prospect of this new specialty.

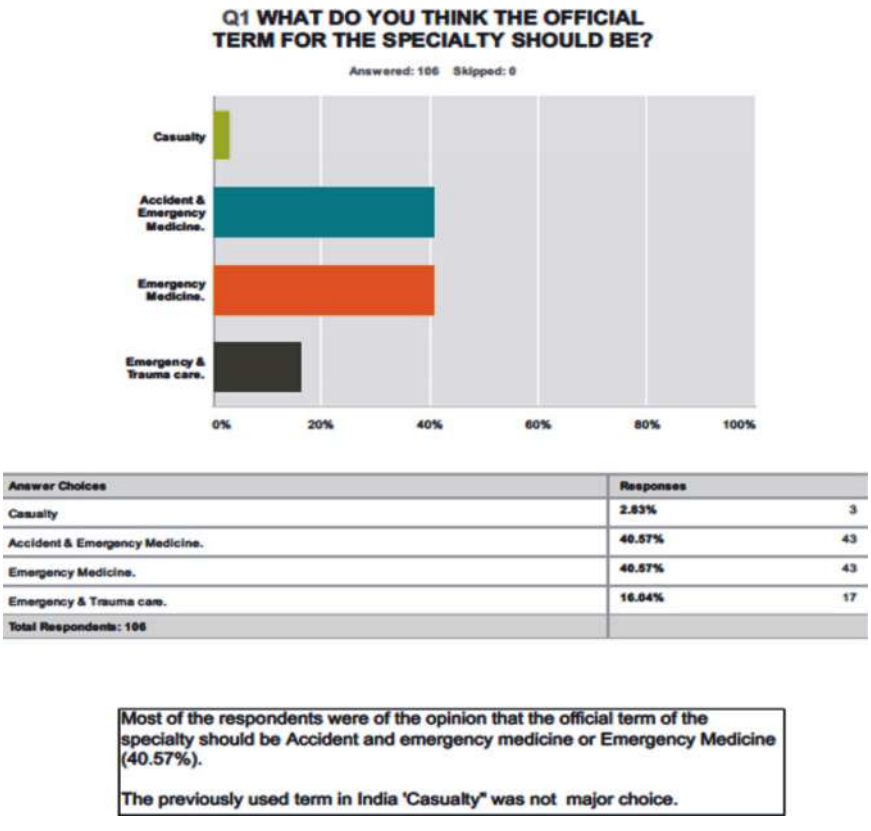
Nomenclature

Traditionally, Emergency departments in India are called ''Casualty'' but recently, the terms ''Emergency Medicine'' and ''Emergency Department'' were introduced. There is, still today, no specific nomenclature of our specialty in India. Though all the training programs in India and the Medical Council of India use the name ''Emergency Medicine'' most of the government and some of the private sector organisations still use the term ''Casualty'', or ''Emergency''. In our survey, we included questions on nomenclature for the specialty (Diagram 1). Most of the respondents were of the opinion that the official term of the specialty should be ''Emergency Medicine'' (40.57%) or ''Accident and Emergency Medicine'' (40.57%). It should, however, be highlighted that the study hospital departments were called the ''Emergency Department'' at the time of this study and that could have been the reason that the previously used term in India ''Casualty'' (2.83%) was not a major choice. Our result closely correlates with the finding of the previous study done by Reid *et al* (2009)[4] in United Kingdom. Our findings points out the need to resolve the current situation where the specialty has several alternative names.

Structure and functions of the Specialty

There is no guideline on the ideal structure of an Emergency Department in India, and hence we included this topic in our survey. Majority were of the opinion that the Emergency Department should be completely equipped and have round the clock coverage by a qualified consultant and registrars trained in the specialty. 93. 40% voted for a fully

Diagram 1

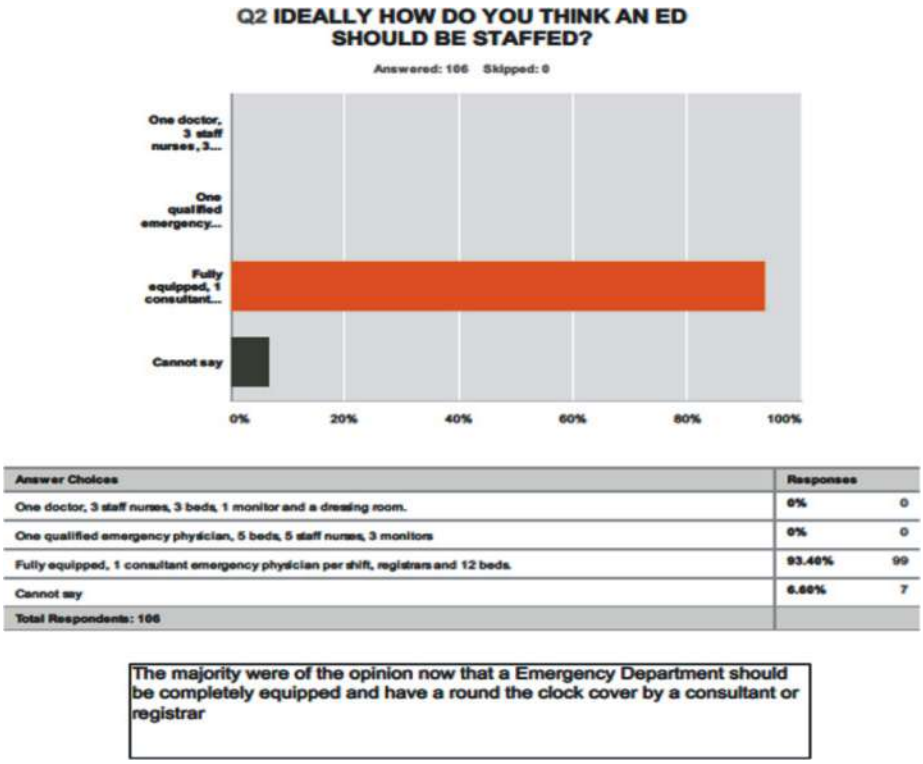


Answer Choices	Responses	
Casualty	2.83%	3
Accident & Emergency Medicine.	40.57%	43
Emergency Medicine.	40.57%	43
Emergency & Trauma care.	16.04%	17
Total Respondents: 106		

Most of the respondents were of the opinion that the official term of the specialty should be Accident and emergency medicine or Emergency Medicine (40.57%).

The previously used term in India 'Casualty" was not major choice.

Diagram 2



Answer Choices	Responses	
One doctor, 3 staff nurses, 3 beds, 1 monitor and a dressing room.	0%	0
One qualified emergency physician, 5 beds, 5 staff nurses, 3 monitors	0%	0
Fully equipped, 1 consultant emergency physician per shift, registrars and 12 beds.	93.40%	99
Cannot say	6.60%	7
Total Respondents: 106		

The majority were of the opinion now that a Emergency Department should be completely equipped and have a round the clock cover by a consultant or registrar

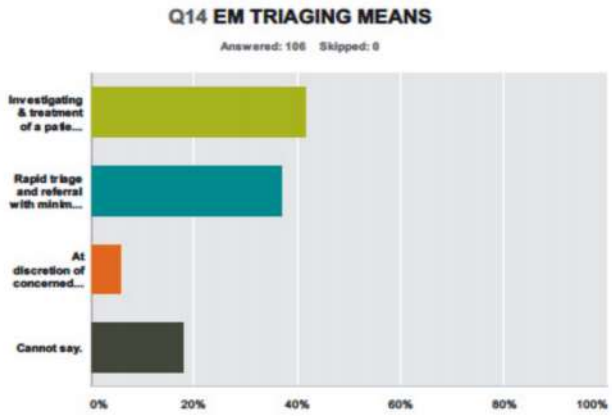
equipped department with at least 1 consultant Emergency Physician per shift, registrars and 12 or more beds. (Diagram 2)

The respondents were of divided opinion when asked if triaging system in India would be beneficial and 17.9% could not say what Emergency triaging was and how it actually works. Almost 19.8% were of the opinion that this would be a failure in India considering the cultural and social grounds where all patients feel that they need priority care, and stable patients if made to wait after categorization will not accept triaging. 30% of the respondents could not give an opinion on triage. (Diagram 14, 15)

The majority of the responders (63.2%) felt that the presence of a complete trauma team in Emergency Department was vital while handling major trauma. Such a trauma team should be led by Emergency physician (100%) along with Anaesthetist, General. Surgeon and Orthopaedic surgeon (63.2%). However, 30.19 % were of the opinion that Emergency Physician with relevant specialty was enough to manage major trauma. The majority of the responders (52.8%) were of the opinion minor trauma could be managed by any trained individual; whereas, 36.79% opined that it should be done by an Emergency Physician. (Diagram 8, 9)

In regards to function of the department, the opinion poll yielded several interesting results.

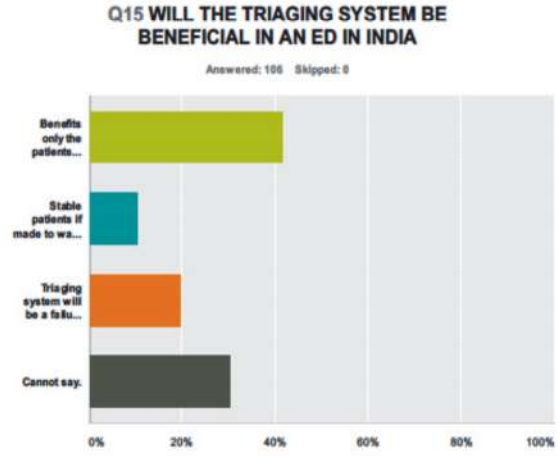
It was interesting to notice that a lot of consultants were not well versed with the abbreviation of "RSI". Here about 40% of the responders thought any trained individual could do a RSI. After they had answered what RSI was, more than 50% percent felt that the Emergency Physician was the right person to do it. Only, 13% felt that only an anaesthetist was the right person to do an RSI. The majority (86%) of the respondents thought that the code blue team should be from the emergency department(ED).13 respondents (12%) felt any trained individual could be a member of the team and 3 respondents did not know what a code blue team was. Even though the majority of respondents (73.5%) felt that a FAST scan should be done by a emergency physician many also though that it was operator dependent. 53 respondents (50%) were of



Answer Choices	Responses	
Investigating & treatment of a patient until a working diagnosis is made & the patient is stable.	41.51%	44
Rapid triage and referral with minimum investigations and treatment.	36.79%	39
At discretion of concerned speciality.	5.66%	6
Cannot say.	17.92%	19
Total Respondents: 106		

The opinion of many respondents were divided about EM traiging.They were of the opinion that it depends on the type of patient coming to the emergency department.
17.9% could not say what EM triaging was and how it actually works.

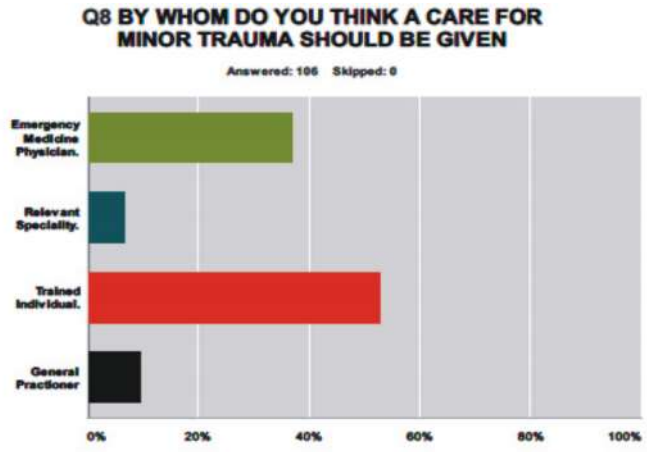
Diagram 15



Answer Choices	Responses	
Benefits only the patients requiring emergent medical attention	41.51%	44
Stable patients if made to wait after categorization will not accept triaging.	10.38%	11
Triaging system will be a failure in India.	19.81%	21
Cannot say.	30.19%	32
Total Respondents: 106		

The respondents were of divided opinions as to if triaging system in India will be beneficial.
Almost 20% of the respondents were of the opinion that this would be a failure in India and 30% of the respondents could not give an opinion.

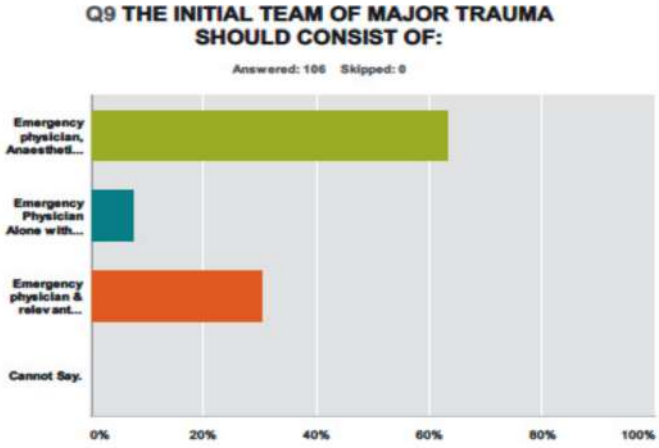
Diagram 8



Answer Choices	Responses	
Emergency Medicine Physician.	36.79%	39
Relevant Speciality.	6.60%	7
Trained Individual.	52.83%	56
General Practioner	9.43%	10
Total Respondents: 106		

The majority of responders were of the opinion (52.8%) that the care of a minor trauma can be given by any trained individual.36.79% were of the opinion that it should be done by the Emergency physician.

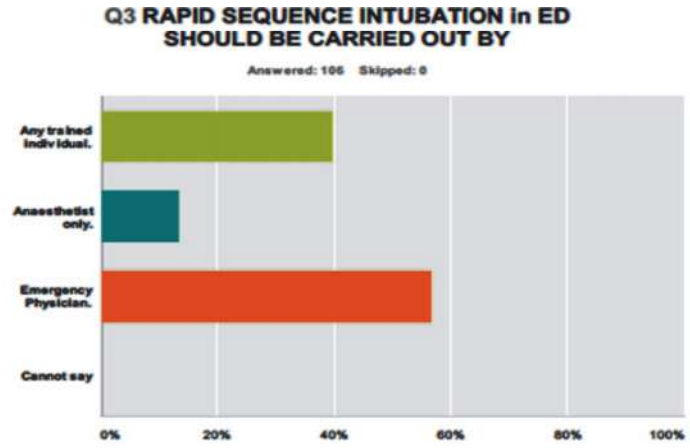
Diagram 9



Answer Choices	Responses	
Emergency physician, Anaesthetist, Gen.Surgery, Orthopedic surgeon.	63.21%	67
Emergency Physician Alone with trained staff and Registrar.	7.55%	8
Emergency physician & relevant speciality consultant.	30.19%	32
Cannot Say.	0%	0
Total Respondents: 106		

The majority of responders were of the opinion (63.2%) that in case of a major trauma the presence of a complete trauma team was vital.
30.19% of the responders were of the opinion that the emergency physician with the relevant speciality was enough to manage a major trauma.

Diagram 3



Answer Choices	Responses	
Any trained individual.	39.62%	42
Anaesthetist only.	13.21%	14
Emergency Physician.	56.60%	60
Cannot say	0%	0
Total Respondents: 106		

Here about 40% of the responders thought any trained individual could do a RSI .After they had answered and asked upon many did not know what RSI actually was and the drugs and the dosages used in it but more than 50% percent felt that the Emergency Physician was the right person to do it. About 13% felt that only a anaesthetist was the right person to do an RSI

the opinion that the thrombolysis should be done in the ICCU only and 53(50%) were of the opinion that it should be done in the emergency department(ED). Only 4% felt that thrombolysis should be done only by a cardiologist whereas most of the others thought that Emergency Physician should do it .When asked about head injury observation, majority of the respondents (78%) responded in favour of neurosurgery ward under neurosurgery. Majority of the responders (>77%) felt that EGDT in sepsis should be achieved in the ED itself and about 15% said that let the relevant consultant decide.

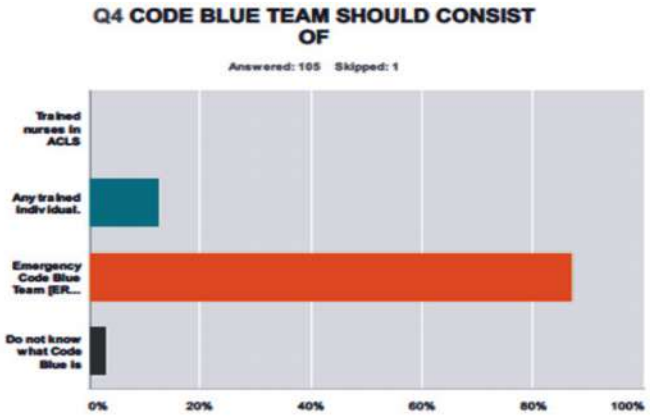
In regards to the disposition of patients from the Emergency department>42% responders wanted the patient to be shifted immediately after stabilization and 37.74% responders thought that it should be as per the ED physician's discretion.

Our survey found that Emergency Medicine as a specialty is gaining greater acceptance and popularity in this country. The majority of the respondents voted for a fully equipped department with 24 hour coverage by trained Emergency Physicians which can contribute to decision-making for emergency departments and further development of the specialty. The respondents were also supportive of a number of areas of practice by Emergency Physicians such as diagnostic ultrasound (FAST), resuscitation, code blue team, major trauma and rapid sequence intubation. However, there were certain areas like thrombolysis and Neuro – observation where there were mixed views by the respondents. These constructive feedbacks have helped us understand the purpose, strengths and weaknesses of our specialty and provide a focus for training and development. (Diagram 1 to 9)

Satisfaction level of local Emergency Departments

Our study also surveyed the satisfaction of different aspects of local Emergency Departments care on a 5-point Likert scale ranging from ''excellent'' to ''poor''.

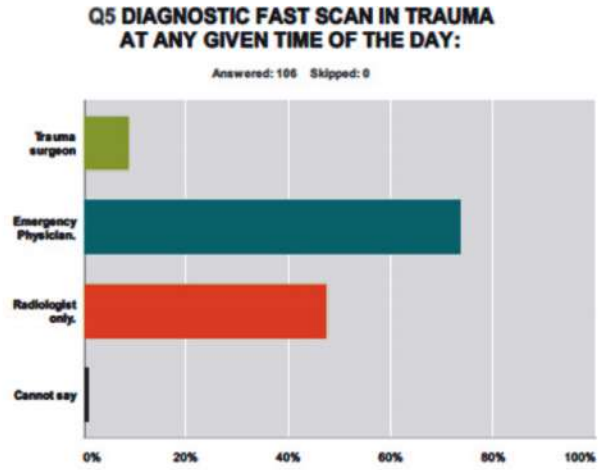
Diagram 4



Answer Choices	Responses	
Trained nurses in ACLS	0%	0
Any trained individual.	12.38%	13
Emergency Code Blue Team [ER doctor, nurses and trained paramedics].	86.67%	91
Do not know what Code Blue is	2.86%	3
Total Respondents: 105		

The majority(86%) of the respondents thought that the code blue team should be from the emergency department(ED).13 respondents (12%) felt any trained individual could be a member of the team and 3 repondents did not know what a code blue team was.

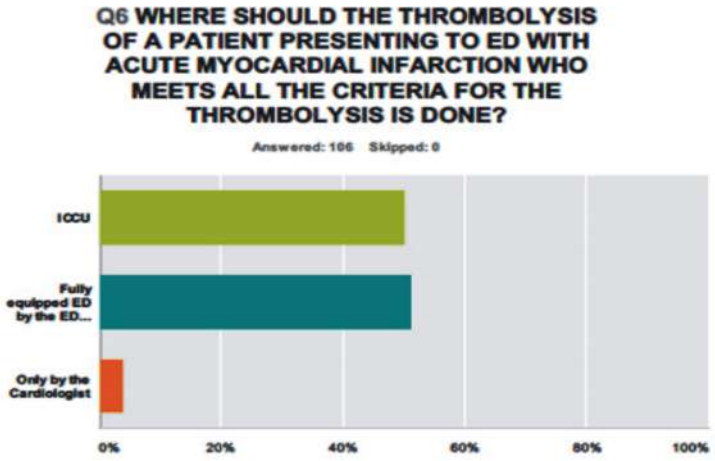
Diagram 5



Answer Choices	Responses	
Trauma surgeon	8.49%	9
Emergency Physician.	73.58%	78
Radiologist only.	47.17%	50
Cannot say	0.94%	1
Total Respondents: 106		

Eventhough the majority of respondents(73.5%) felt that a FAST scan should be done by a emergency physician many also though that it was operator dependent.Almost 47% felt is should be done by the radiologist only.
9 respondents thought that the trauma surgeon was the best person and 1 respondent did not know what a FAST scan was.

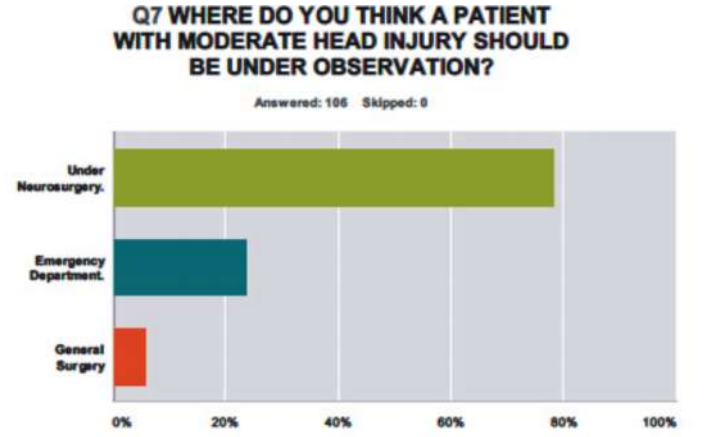
Diagram 6



Answer Choices	Responses	
ICCU	50%	53
Fully equipped ED by the ED physician if needed.	50.94%	54
Only by the Cardiologist	3.77%	4
Total Respondents: 106		

53 respondents(50%) were of the opinion that the thrombolysis should be done in the ICCU only and 53(50.94%) were of the opinion that it should be done in the emergency department(ED) if needed.
About 4% felt that it should be done only by a cardiologist.

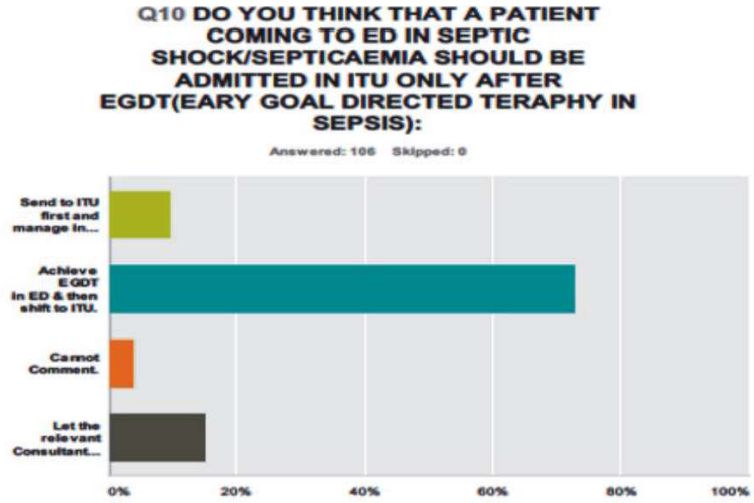
Diagram 7



Answer Choices	Responses	
Under Neurosurgery.	78.30%	83
Emergency Department.	23.58%	25
General Surgery	5.66%	6
Total Respondents: 106		

83 respondents (78%) responded in favour of nuerosurgery.
some felt if the initial CT was normal the patient could be observed in the emergency department(ED)(23.5%).

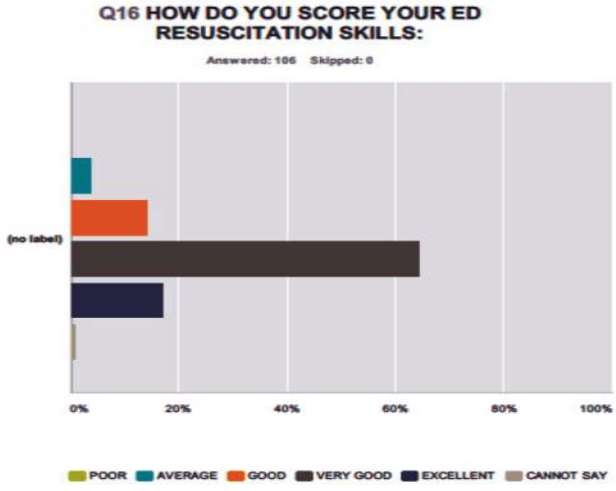
Diagram 10



Answer Choices	Responses	
Send to ITU first and manage in ITU.	9.43%	10
Achieve EGDT in ED & then shift to ITU.	72.64%	77
Cannot Comment.	3.77%	4
Let the relevant Consultant Decide.	15.09%	16
Total Respondents: 106		

72.64%(77) responders were of the opinion that in a patient coming to ED in septic shock the goal should be to achieve EGDT in the ED as early as possible and then shift the patient to ITU under the relevant speciality.

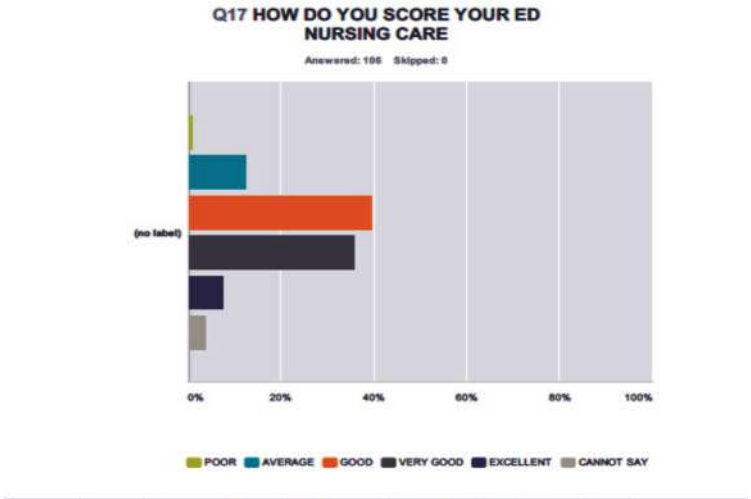
Diagram 16



	POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT	CANNOT SAY	Total	Average Rating
(no label)	0% 0	3.77% 4	14.15% 15	64.15% 68	16.98% 18	0.94% 1	106	3.97

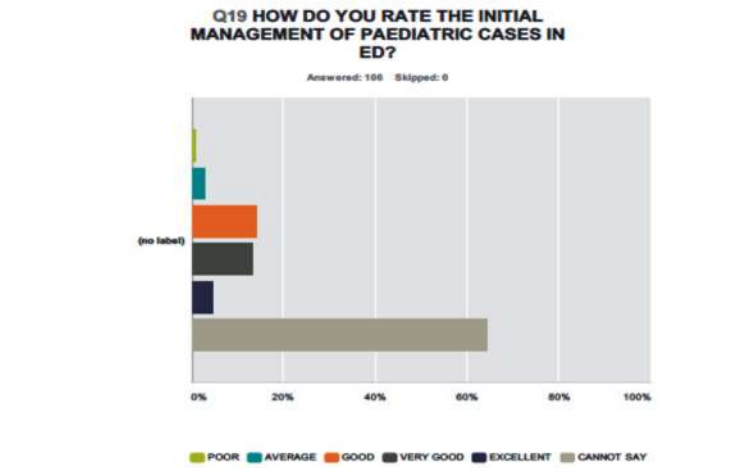
Almost 81% of responders rated the ED's resuscitation skills as excellent or very good. (Diagram 16) 83% of the consultants rated the treatment of their patients in the Emergency department as excellent or very good.(Diagram 21) The other areas that were highly appreciated were management of sepsis patients (72.64%) (Diagram 10) and trauma resuscitation skills (93%). The respondents also felt that Emergency Physicians were very good in hands

Diagram 17



	POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT	CANNOT SAY	Total	Average Rating
(no label)	0.94% 1	12.26% 13	39.62% 42	35.85% 38	7.55% 8	3.77% 4	106	3.48

Diagram 19



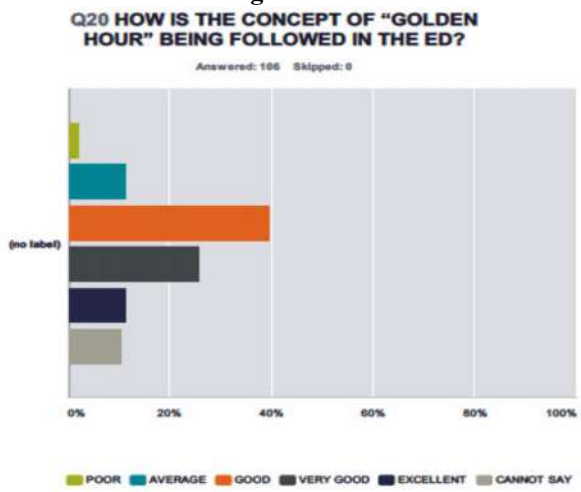
	POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT	CANNOT SAY	Total	Average Rating
(no label)	0.94% 1	2.83% 3	14.15% 15	13.21% 14	4.72% 5	64.15% 68	106	5.10

on skills like temporary pacing and FAST scan. It is very encouraging to see that skills of Emergency Physicians were highly appreciated by most of the respondents.

ED Diagnosis was given an intermediate rating (34% excellent/very good and 39% good). The respondents also gave an intermediate rating to the concept of "Golden Hour" being followed in the Emergency Department (34% excellent/very good and 39% good).(Diagram.20) There was a mixed response to the question regarding the ER nursing care where many of the responders were divided between Good (39%) and Very Good (43%).(Diagram 17) This can be attributed to the fact that in India there is no specialized nurses training for Emergency Medicine and that most of the new recruits with no experience are made to work in the Emergency Department.

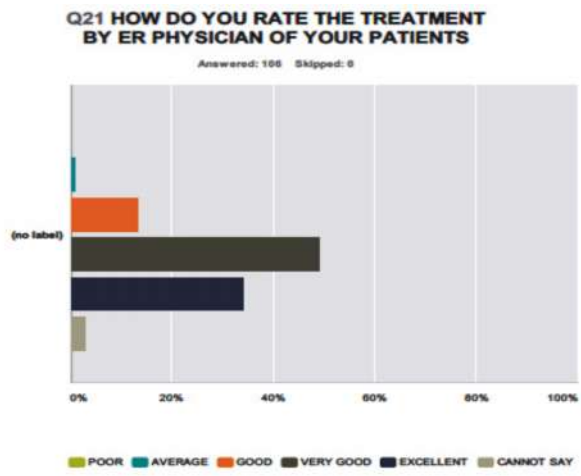
There was low satisfaction amongst the respondents with management of paediatric emergencies. 64.15 % of the respondents did not comment on this area and only 15% rated as very good or excellent. (Diagram No. 19) The lack of Emergency Physicians with paediatric specialisation and specialized

Diagram 20



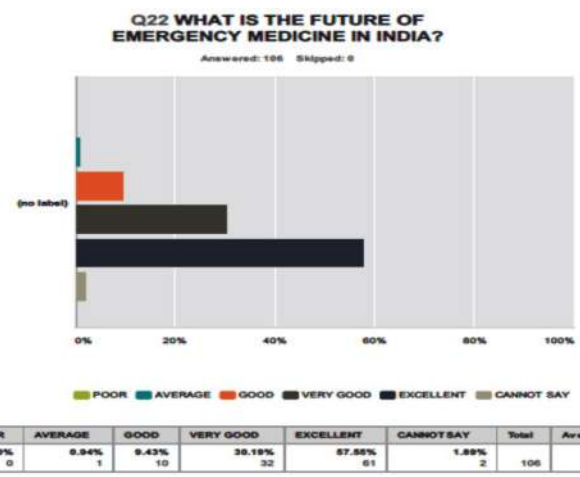
	POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT	CANNOT SAY	Total	Average Rating
(no label)	1.89% 2	11.32% 12	39.62% 42	25.47% 27	11.32% 12	10.38% 11	106	3.64

Diagram 21



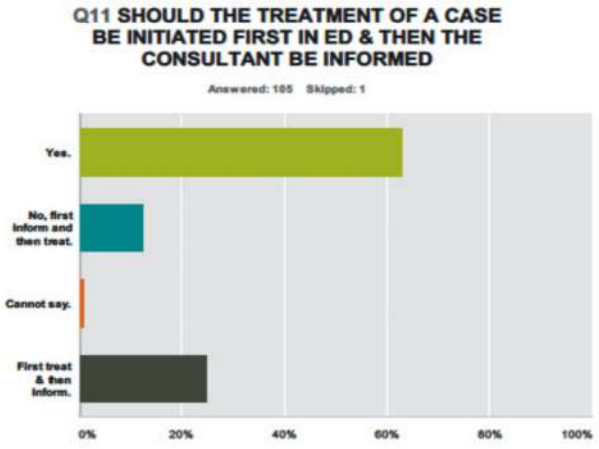
	POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT	CANNOT SAY	Total	Average Rating
(no label)	0% 0	0.94% 1	13.21% 14	49.06% 52	33.96% 36	2.83% 3	106	4.25

Diagram 22



	POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT	CANNOT SAY	Total	Average Rating
(no label)	0% 0	0.94% 1	9.43% 10	30.19% 32	57.55% 61	1.89% 2	106	4.50

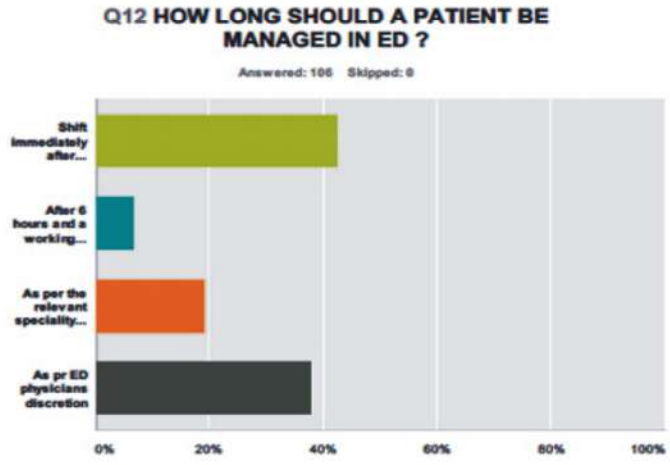
Diagram 11



Answer Choices	Responses	
Yes.	62.86%	66
No, first inform and then treat.	12.38%	13
Cannot say.	0.95%	1
First treat & then inform.	24.76%	26
Total Respondents: 105		

The majority of respondents were of the opinion that the patients should be first managed and then the relevant consultant informed.

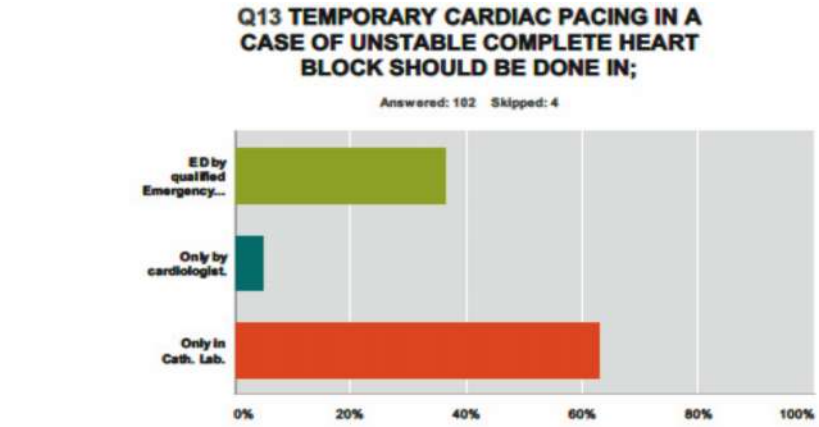
Diagram 12



Answer Choices	Responses	
Shift immediately after stabilization.	42.45%	45
After 6 hours and a working diagnosis is achieved.	6.60%	7
As per the relevant speciality consultants advise.	18.87%	20
As pr ED physicians discretion	37.74%	40
Total Respondents: 106		

The majority of respondents (42.45%) were of the opinion that a patient should be shifted under the relevant speciality's care immediately after stabilization.
37.7% of the respondents felt that it should be done as per the ED Physicians discretion but many were of the opinion that it was depending on how qualified the physician was.

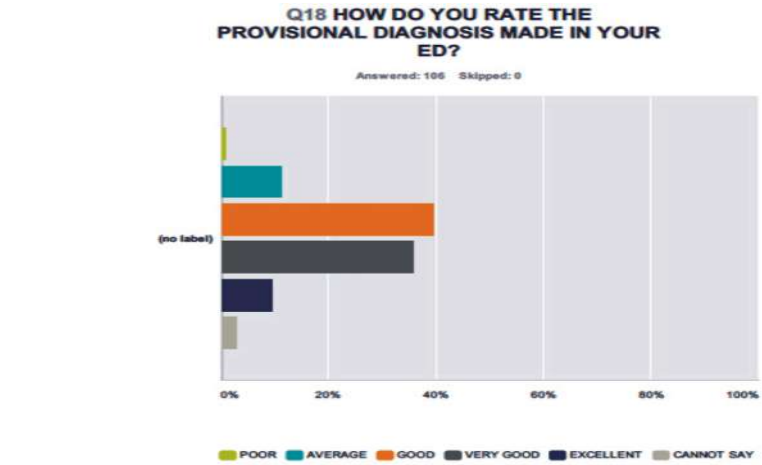
Diagram 13



Answer Choices	Responses	
ED by qualified Emergency Physician.	36.27%	37
Only by cardiologist.	4.90%	5
Only in Cath. Lab.	62.75%	64
Total Respondents: 102		

The majority of responders (62.7%) were of the opinion that emergency temporary cardiac pacing in a case of unstable complete heart block should be preferably done in a cath. lab by a ED physician or cardiologist to minimize risks and 36.2% of the respondents were also of the opinion that it can be done in the emergency department by the emergency physician if warranted.

Diagram 18



	POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT	CANNOT SAY	Total	Average Rating
(no label)	0.94% 1	11.32% 12	39.62% 42	35.85% 38	9.43% 10	2.83% 3	106	3.50

Paediatric Emergency Departments in India may have been the cause of such a response by the consultants. This area of low satisfaction offers an opportunity for service improvement in the form of training and development.

Future of Emergency care in India

The most encouraging response in the study was the response to the question on the future of Emergency Medicine as a specialty in India. (Diagram No.22)

Almost 87% of the responding consultants felt that the future of EM in India is very good to excellent. This not only shows that Emergency Medicine is gradually making inroads as a specialty in this country but also has very good prospects in future.

CONCLUSION

Based on the responses of this study it is clear that although there are some shortcomings in the understanding and acceptance of Emergency Medicine the specialty has come a long way over the past decade and is steadily gaining greater importance and acceptance amongst the medical fraternity of this country. This study has provided valuable insights with respect to the perspectives of our colleagues from other disciplines regarding the specialty. This could be instrumental in providing direction and guidance to our policy makers in formatting effective Emergency Department infrastructure and logistics. This could also be helpful in framing training policies for Emergency Physicians. Our study provides healthy feedback which can be used as an objective assessment tool for further developing and strengthening of specialty. This concept of seeking multi-source feedback could be beneficial to other specialties as well as a quality control measure for improvements in the present standard of care.

Though our study provides valuable input on the future of Emergency Medicine as a specialty in India however local nature of the study makes generelizability a significant limitation. So we suggest further research on this subject to be carried out at a national level in order to overcome this limitation and acquire national level data on this important aspect. Further similar studies looking at feedback from other groups like patients and general practitioners would provide additional and interesting feedback. In fact this could be the beginning of an entirely new vista of research possibilities which have the potential to provide statistically significant quality control measures based on which we can frame policies and take training initiatives with the aim to improve standards of emergency care in India.

Key Message

Our study found that Emergency Medicine is accepted by other departments as a new specialty. The perceived purposes and strengths provide a focus on proper training and development of Emergency Medicine, while opinions on new practices and weaknesses indicate scope of improvement.

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Indian Journal of Emergency Medicine
Volume 1 Number 1 January - June 2015

PERCEPTION AMONG EMERGENCY PHYSICIANS OF INDIA REGARDING LEGAL ISSUES GOVERNING EMERGENCY MEDICAL PRACTICE

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ABSTRACT

Background: Although it is a realised need, most hospitals in India tend to avoid dealing with medico legal formalities during emergencies. In a busy Emergency Room physicians tend to overlook legal formalities mostly as an oversight owing maybe to lack of training and lesser supervision. **Aim:** To find out the perception among Emergency Physicians of India regarding legal issues concerning Emergency Medical Practice. **Materials and Method:** A pre-structured, pre-tested questionnaire was devised and sent by e mail to member physicians of the Society of Emergency Medicine in India chosen by simple random sampling requesting them to fill up the forms and send it back by e mail. Sample size was calculated to be 84. **Statistical Analysis:** The study showed overall mean perception of 69% with a confidence interval of (70.5 to 67.3). The individual perception scores of questions have been given in the statistical analysis portion of the dissertation. The majority of study population were in their third decade. **Result:** The study came up with an interesting fact that majority of the younger age group of emergency physicians had more perception than their elder counter parts. This proves that the older emergency physicians need some form of legal training in order to improve their perception regarding the legal scenario in India. **Conclusion:** The study paves a path for further studies to occur.

KEYWORDS

Emergency physician of India; Dealing of legal issues in emergency department.

INTRODUCTION

Emergency Medicine is an upcoming speciality in India. It was only in 2009 that it was recognised as a separate speciality. This is perhaps the reason that the Government of India is still not being able to provide/ arrange for quality emergency medical care fully in the country. There is a dire need for structured courses in Emergency Medicine in this country. As of now as a stepping stone, the Medical Council of India has started an MD course in Emergency Medicine but those are taught by consultants from other specialities. Existing structured courses in India like Master in Emergency Medicine (Perhaps the only structured emergency medicine course in India) are still battling for their existence.

It may be inferred from the above that the area of work of an emergency physician in India is still perceived to be that of a post – master who directs the patients to their so called appropriate specialities. There is practically no concept of emergency medicine health care amongst our peers from other specialities. Further it has been inculcated into the minds of existing emergency physicians that they do not even belong to any speciality like emergency medicine. They are used to work under Anaesthesia or Surgery or Medicine etc.

The time has come to lift the morals and prestige of the pioneers of this subject who do not value themselves. They should have a minimum perception of what emergency medicine is. This perception

needs to be evaluated among different strata of emergency medicine physicians and placed in front of them so they can see the actual picture and improve them accordingly. This also means that there is a further scope of study especially among other strata of emergency medicine. This study is an endeavour to measure the perception of physicians of India who belong to a class presumed to have some knowledge of emergency medicine.

This randomised email based cross – sectional study is a representation of the legal perception of emergency medicine physicians in India.

The perception of medico legal issues amongst Emergency Medicine Physicians of India has often been questioned. Since the speciality itself is struggling for recognition in India at present, it is quite obvious that the physicians are fearful of being entangled in legal hassles often. Even the Courts or Parliament the term 'Medical Emergency' has not been properly defined.

The existing emergency medicine practice is only limited to urban areas. This has made emergency medical care out of reach of rural India. Though the 'Right To Life' is guaranteed by the Constitution of India in reality this specialized care is yet to reach out to the common man and till then these legal hurdles has to be faced by the emergency physicians of India.

There are many laws, rules and regulations in India regarding the emergency medical care but we are really sorry to state that most of our existing physicians do not have an answer to that.

Hence perception studies like this should be encouraged. This study paves the way for further studies to take place. Emergency Medicine should be recognised as a separate entity and take its rightful place in the various specialities of Medicine.

MATERIAL AND METHODS

This study was conducted between January 2012 and Dec 2013.

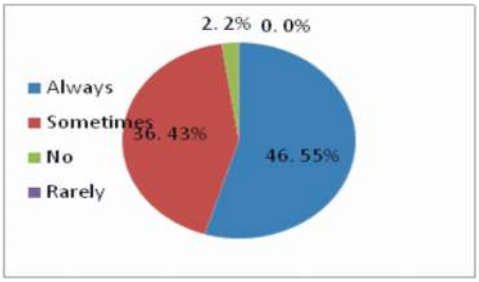
The Universe consisted of members of the Society of Emergency Medicine in India. Simple linear random sampling technique was applied to obtain the sample for the study from amongst them. So Included criteria was physician should have worked in an Emergency/Casualty Department of any hospital in India. And they should have remained in the same work place during the study period. But those working in any other place/department in addition to their duties in the Emergency/ Casualty Department were excluded. The sample size for this study was taken to be 84.

A pre-structured, pre-tested questionnaire was devised and sent by e mail to the physicians concerned requesting them to fill up the forms and send it back by e mail. The data so obtained was scrutinised, tabulated, analysed and is being presented to concerned.

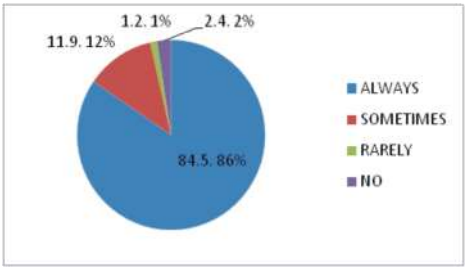
RESULTS

As this is questionnaire based study, several questions were formed & data interpretation was done

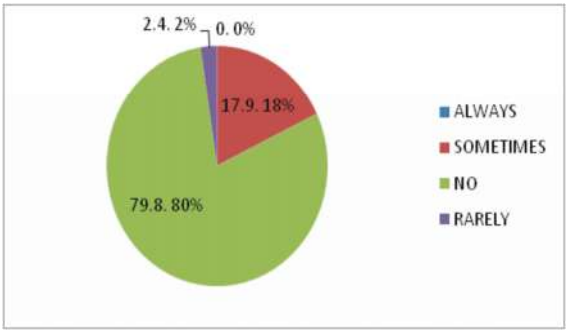
Q 1: Showed Patient welfare is always the primary responsibility of the Emergency physician



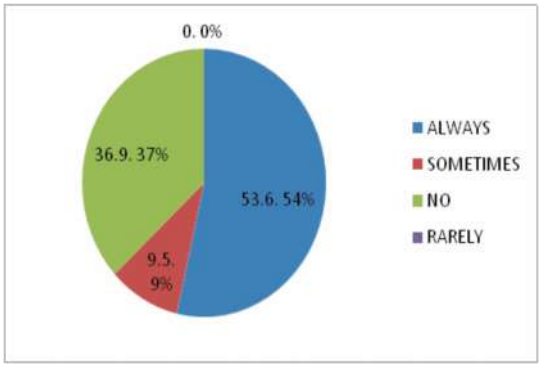
Q 2: Showed every procedure done in Emergency Department does not require consent.



Q 3: Reveals it is not wise to wait for consents in regards to life saving procedures in Emergency Department



Q 4: Represents the Indian mindset of correct communication

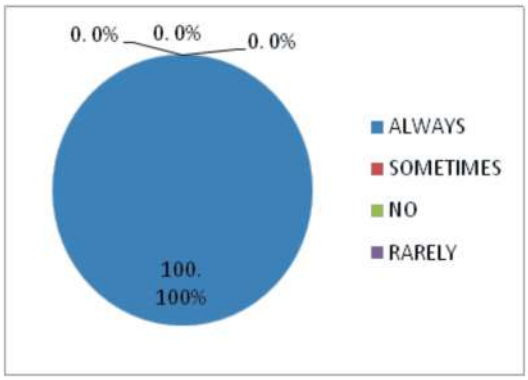


accordingly.

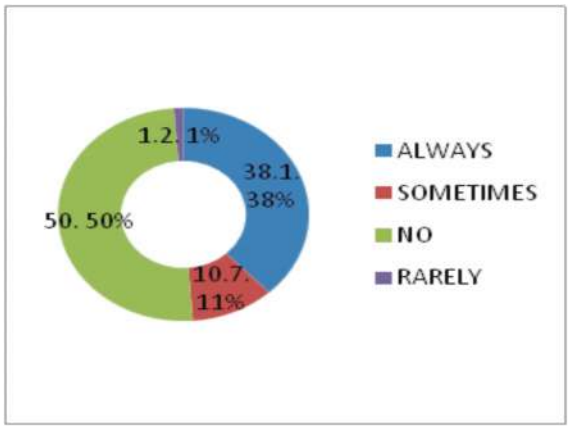
The above pie-chart reveals that only 46% of the population believe that patient welfare is the primary professional duty and a majority believe that it is only sometimes that patient welfare is the primary responsibility of the physician.

Though it is a common practice to take informed

Q 5: Shows that diagnosis such as HIV positivity should be truthfully communicated to the patients



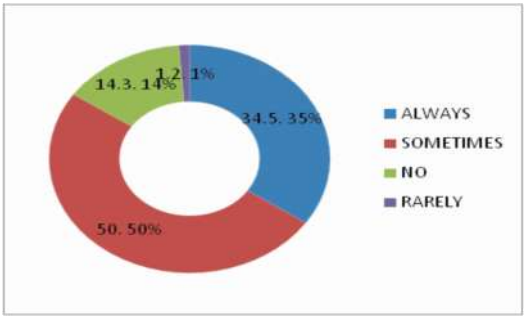
Q 6: Euthanasia is not supported in India till date



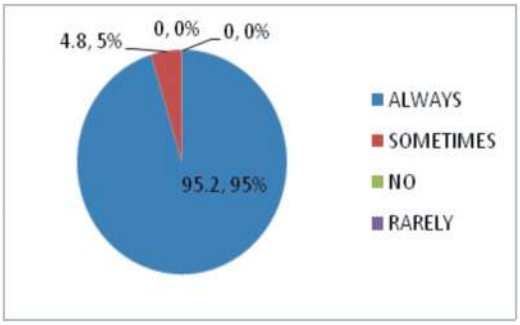
consent even before the start of treatment in emergency department as the above reveals it should not be so. Certain procedures and treatment definitely require consent which becomes evident during the course of care but emergency resuscitation does not require consents for life saving procedures.[19]

The above reveals correctly that 79.8% one should not wait for consents in case of a life saving procedure.

Q 7: In case of resuscitation no informed consent is required to perform a life saving procedure



Q 8: It is always mandatory to take Ethical committee approval to perform a Clinical Research in an institution



Q9: If the hospital does not treat a patient in emergency then it constitutes a violation to the "Right to Life" which is guaranteed under article 21 of the Constitution of India.[2]

	Yes	No	Undecided	Total
You violate the patient's 'Right to Life	50	32	2	84
You exercise your own right to choose a patient.	32	50	2	84
You do not commit anything	39	41	4	84
You are ethically wrong but legally correct	14	66	4	84

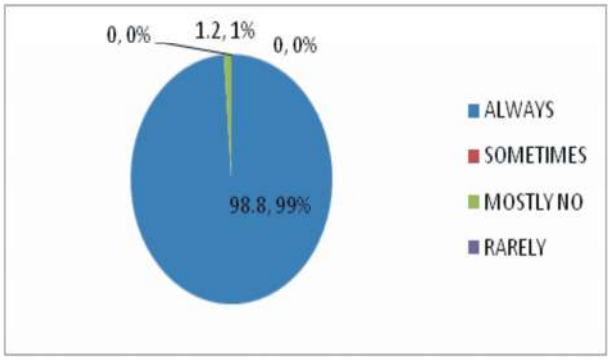
In India it would be taken otherwise by the patient's relatives/well – wishers or the patients themselves if correctly communicated about certain clinical condition. Hence the above diagram rightly reflects the Indian scenario.[19]

As represented correctly all the doctors correctly believe that the clinical condition should be correctly and truthfully communicated to the patient .

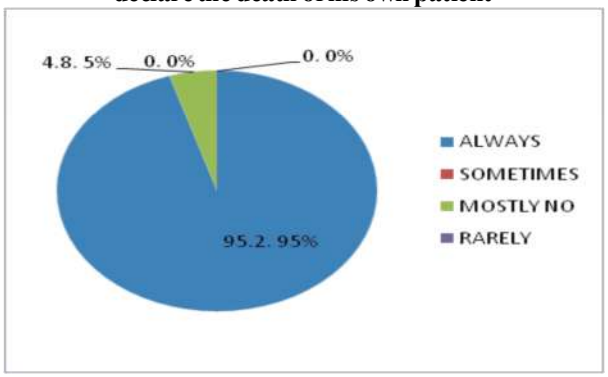
The above represents that 50.5% actually knows the above statement.

The above depicts the fear of doctors and misunderstanding of the law in order to avoid legal hassles. If the Court finds that life saving care was not done as the doctor was unable to secure consent from the party the Emergency physician would be held legally responsible.[22]

Q 10: It is mandatory to file MLC reports to the police station under whose jurisdiction the hospital belongs to in all medico legal cases



Q 11: Shows that the treating doctor should always declare the death of his own patient



In the above 95% actually supports the statement.

In India the practice of emergency medicine is centralised. It is in the bigger hospitals mostly located in metropolises that it is followed somewhat. Although it is a realised need, most of the hospitals tend to avoid dealing with medico legal formalities during emergencies. (Supreme Court of India; Parmanand Katara vs. Union of India AIR1989 SC2039)

Q 12: The chart below represents that doctors as well as patients should be aware of their respective rights

	Yes	No	Undecided	Total
Let him go without further explanations	31	51	2	84
Ensure there are no miscommunications or misunderstandings at the root of the refusal	83	1	0	84
Try to develop an alternative to the original plan, which does not significantly alter the risk to the patient	78	5	1	84
Communication and negotiation between the patient and provider fail and the patient possesses decisional capacity, the patient may choose to refuse care or end the encounter "against medical advice" after proper documentation.	83	0	1	84

Q 13: Advice against medical advice Documentation should always contain the following points					
Sl no		Yes	No	Undecided	Total
1	Documentation of capacity to take intelligent, and reliable decisions (ideally with examples and examination clearly noted)	80	2	2	84
2	Discussion of the risks reviewed with the patient/relatives	84	0	0	84
3	Discussions about cost of therapy	79	4	1	84
4	Discussions about plan of management	53	30	1	84
5	Explanation of any potentially problematic entries in the chart such as nursing notes or abnormal laboratory values	78	5	1	84
6	Patient's signature, and if patient refuses to sign, document that fact	82	1	1	84
7	Documentation of relatives /patient's consent of procedures	84	0	0	84
8	Documentation of information sent to police/judiciary.	75	6	3	84
9	Even though a patient leaves against medical advice, reasonable treatment should be provided as appropriate and concordant with the patient's wishes.	83	0	1	84

Q 14: Patient's care is the responsibility of every health care staff of the hospital but ultimately the treating doctor is responsible				
	Yes	No	Undecided	Total
Doctor	35	36	13	84
Nurse	45	1	38	84
Patient	1	83	0	84
Ward Boy	40	7	37	84

This problem was addressed to a certain extent when the judiciary mandated the delivery of health care by every hospital regardless of the patient's paying capacity and medico legal status in times of medical emergencies. If the hospital does not do so then it constitutes a violation to the "Right to Life" which is guaranteed under article 21 of the Constitution of India.[2]

99% of physicians is correctly aware that in all medico legal cases an FIR should be made.

The above represents that the doctors correctly answered that only the treating doctor should declare death. It should not be done by some other person.

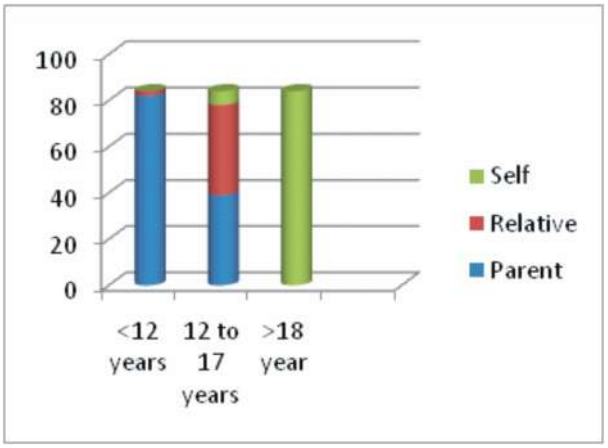
It says that majority of the physicians are aware of the patient and physicians Rights

The above shows that the doctors correctly support the statement above.

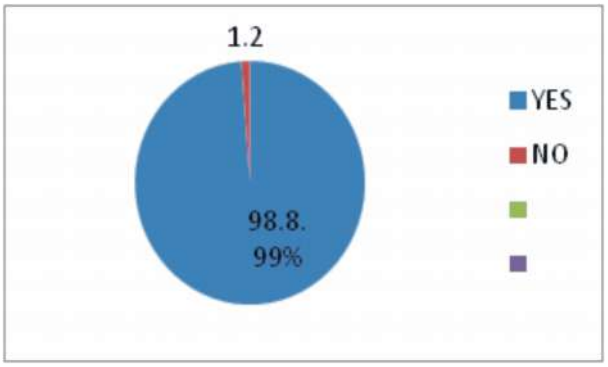
Q 15: Shows that it is the duty and obligation to ensure safe administration of a drug making the doctor equally or even more responsible in case of a wrong drug administration by a nurse				
Sl No	Yes	No	Undecided	Total
Doctor	11	44	29	84
Nurse	84	0	0	84
RMO on Duty	41	42	1	84

Q 16: Death Certificate must contain all the points mentioned in the chart and every physician should be aware of it					
Sl No	Contents	Yes	No	Undecided	Total
1	Identification mark	45	38	1	84
2	Patient's illness like Diabetes Mellitus or Hypertension which do not directly lead to the death.	83	1	0	84
3	Disease or condition directly leading to death	84	0	0	84
4	Date of Birth	46	36	2	84

Q 17: Shows that legality of a consent varies and depend on age



Q18: Shows that the Indian Laws does not effectively protect the Indian doctors



Only 15.47 percent of the population is aware that the doctor is responsible for the patient care lapse e.g. if the patient remains unattended if he soils the bed though everyone in the above chart is responsible the treating doctor is ultimately responsible.

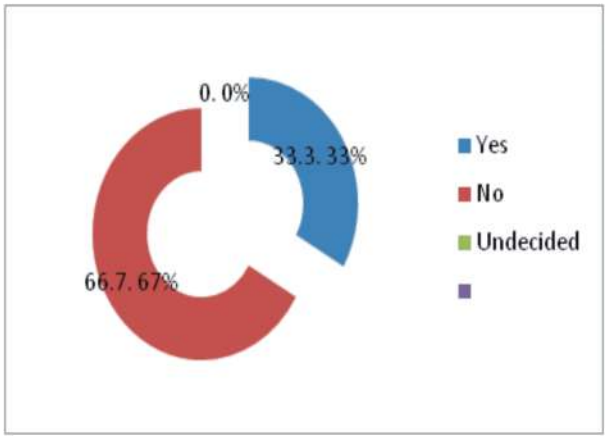
Only a small percentage (13.09%) actually know that a doctor is fully responsible for the above scenario.

Though it is absolutely necessary to follow the above 53.7% and 54.76% only correctly knew that identification mark and date of birth should be incorporated in the death certificate.

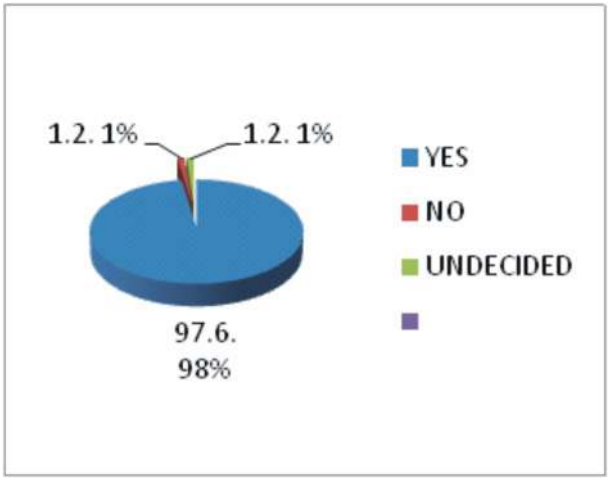
The consent varies depending on the scenario at different ages some of the examples have been given below.

- For medico-legal examination 12 years and above.

Q 19: Shows that most Emergency physicians feel that there is a lot more to offer pertaining to this subject



Q 20: Shows physicians should know 'Code of Medical Ethics'



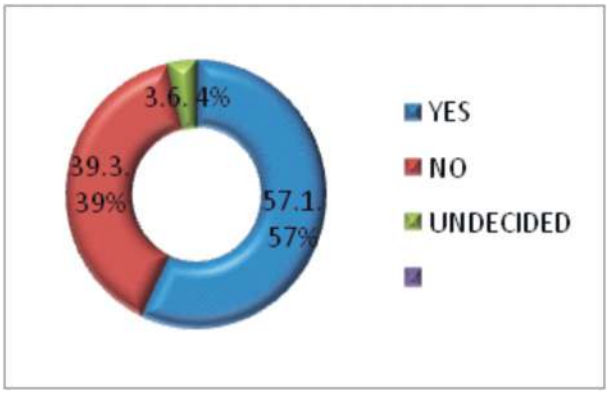
- For sexual intercourse 16 years and above.
- For operation to suffer any bodily harm 18 years and above otherwise the parent/guardian have to give consent

A child under 12 years of age and an insane person cannot give valid consent.

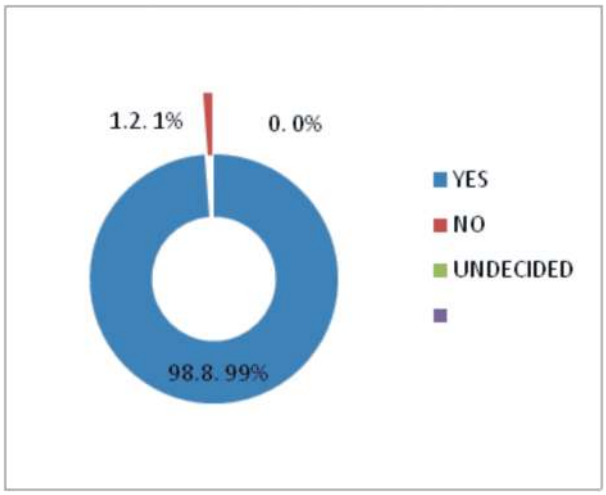
98.9 % of the physicians actually believe that the Indian Laws does not protect the doctors effectively.

56.7% actually feel that the medico legal issues should be discussed in more details in the medical undergraduate curriculum

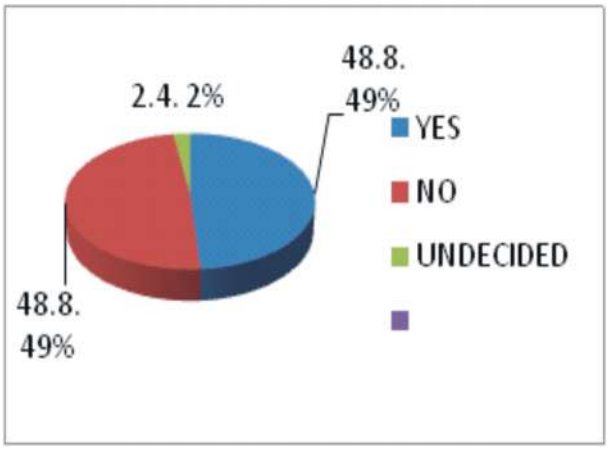
Q 21: Shows that death certificate is required for amputated parts like little fingers, legs etc. before taking it away from the hospital



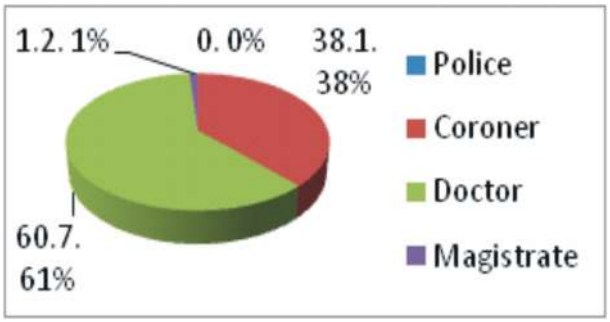
Q 22: In all poisoning cases is an FIR necessary



Q 23: It is the responsibility of the present doctor to record the dying declaration of a mentally fit patient even if he has slightest hope of recovery



Q 24: In India, inquest is carried by all except doctor



The above represents that majority of the physicians correctly feel that the code of medical ethics should be known to the physicians e.g. Declaration of Geneva and the Declaration of Helsinki?

Amputed body parts require death certificate by law.[25] It seems a vast majority are unaware of it.

All poisoning cases should have a police information report otherwise it is a crime and nearly all know about it.

There was an equal response but actually nearly half of the physicians are not aware of the above statement.

Only 60.7% of physicians are aware of the above statement.

Statistical Analysis

The above chart depicts gender distribution in different age groups. It is seen that majority of the study population is in the second to third decade. It mainly signifies that the majority of the population is young. Females are more in the third and fourth decade.

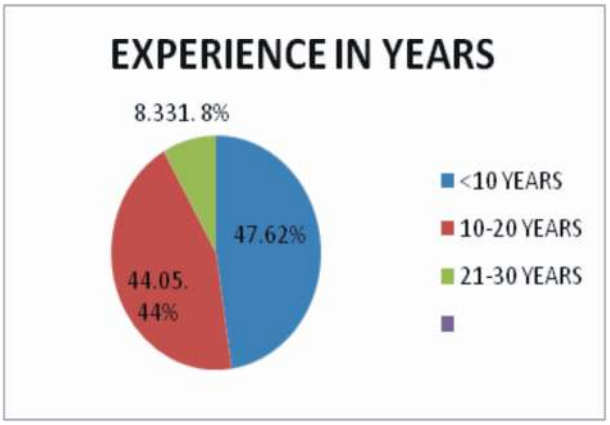
It seems that most of the study population has less than ten years of experience. However the other group of ten to twenty years of experience almost equally matches it. .

The above depicts high level of perception in the majority of female population. 57% of female

Table I: Age and Gender Distribution of the Study Population

Sl No	Age in Years	Gender		Total
		Male	Female	
1.	20-30	42	4	46
2.	31-40	22	8	30
3.	41-50	6	1	07
4.	>50	1	0	01
Total		71 (84%)	13 (16%)	84

Diagram I



population has a perception level of more than 70%.

The above two tables represent the levels of perception in various age groups along with the respective mean, median and standard deviation with the maximum and minimum perception. It seems that the younger physicians are more medico legally conscious than their older counter parts which is in fact healthy. Maybe some might argue that the representations of different age groups are not the same. It is also seen in this table that the minimum in the lower age group is the lowest. N represents the total number of observations which is number of doctors in this case.

The above table shows relation of experience along with perception percentage in the study population. It seems the younger age group has more aware of legal issues than their older counterparts.

Table II: Female gender perception in different age groups

Sl No	Age Groups	Perception level of 60% to 70%	Perception level of >70%
1.	20 -30	1	3
2.	31-40	5	3

Table III(a): Perception

Age_GRP	Mean	Std. Deviation	N	Median	Minimum	Maximum
20-30 years	69.4915	7.76708	51	72.8814	38.98	86.44
31-40 years	68.7046	6.21438	28	69.4915	59.32	76.27
41 - 50 years	63.7288	6.73715	5	62.7119	55.93	74.58
Total	68.8862	7.27534	84	72.8814	38.98	86.44

Table III(b)

		GRP_All			Total
		<60%	60-70 %	>70%	
Age_GRP	20-30 years	3 (5.9%)	17(33.3%)	31 (60.8%)	51(100.0%)
	31-40 years	1(3.6%)	14 (50.0%)	13 (46.4%)	28 (100.0%)
	41 - 50 years	1(20.0%)	3(60.0%)	1(20.0%)	5 (100.0%)
Total		5 (6.0%)	34 (40.5%)	45(53.6%)	84 (100.0%)

Table IV: Experience

		Perception			Total
		<60%	60-70 %	>70%	
Experience	<= 10 years	4 (5.2%)	30 (39.0%)	43 (55.8%)	77 (100.0%)
	10-20 years	1 (14.3%)	4 (57.1%)	2 (28.6%)	7 (100.0%)
Total		5 (6.0%)	34 (40.5%)	45 (53.6%)	84 (A100.0%)

DISCUSSION

The perception of medico legal issues amongst Emergency Medicine Physicians of India has often been questioned. Since the speciality itself is struggling for recognition in India at present, it is quite obvious that the physicians are fearful of being entangled in legal hassles and this forms the basis of this study. The studies in this field are lacking. This study in fact paves for future studies to take place.

This study presents some important facts. The majority of the study population are in their third decade and hence young. The females were mostly in the third and fourth decade. Most emergency physicians included in the study had less than ten years of experience. It was found that females had good perception. The study showed overall mean perception of 69% with a confidence interval of (70.5 to 67.3). The individual perception scores of questions have been given in the statistical analysis portion of the dissertation.

This perception level is not sufficient enough for the health care providers as the mean percentage of passing in case of Emergency Medicine course is usually above seventy percent. Hence it make one understand that there is further scope for understanding and knowing in this field of legal affairs in Medicine.

Since in India the field of emergency medicine has huge potential and opportunities it should also be borne in mind that the legal issues are cropping up. Therefore it is very important to have perception of legal issues pertaining to Emergency Medicine Practice.

Since it is the Emergency Physician who primarily deals with the majority patients presenting to the hospital it is he who deals with medico legal issues the most. Hence it is very important to have a high level of perception among them.

CONCLUSION

The study came up with an interesting fact that majority of the younger age group of emergency physicians had more perception than their elder counter parts. This proves that the older emergency physicians need some form of legal training in order to improve their perception regarding the legal scenario in India. The mean perception however came out to be very poor. Though the young were more wise, both they and their older counterparts require a continuing medical education to keep up the level of their knowledge.

It was also found that the female doctors had good perception though the number of female doctors was less than their male counterparts.

ACKNOWLEDGEMENT

Our sincerest thanks to Dr Byomkesh Manna for his guidance, and full statistical analysis.

I would like to acknowledge the support and help I received from my collegues and faculty in completing this dissertation

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Original Article

Indian Journal of Emergency Medicine
Volume 1 Number 1 January - June 2015

FACTORS AFFECTING PSYCHOLOGICAL WELLBEING OF EMERGENCY PHYSICIANS IN INDIA

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ABSTRACT

Background: In recent years, several studies done in the western world shows that prevalence of burnout syndrome are increasing among doctors.[1] The aim of our study, which is the first in India, to analyze the factors that impact on psychological health of Emergency Physicians. **Methods:** We did a cross-sectional email questionnaire based survey on 195 Emergency Physicians of different Emergency Departments of India. **Results:** Out of the 195 Emergency Physicians who participated in the study, 72.31% suffered from moderate to severe depression by the Becks modified depression inventory. Our study identified that interruption of family and social life, lack of perception by other speciality, night shifts, resource inadequacy and lack of career development as major causes of stress amongst Emergency Physicians in India. 8 hour shift (48.89%), regular discussion on medical & administrative issues (31.79%), regular exercise & de addiction (36%), adequate financial compensation (71.79%), academic development (70%), recognition in Indian healthcare system (65.3%), development of Emergency Departments of International Standard (35.3%) and Pre hospital Care (55.3%) were the major recommendations by the participants to reduce stress and promote psychological wellbeing. **Conclusion:** There is considerable number of factors causing high levels of stress amongst Emergency Physicians working in India. Cope-up strategies recommended by the participants of our study should draw attention of other Emergency Physicians, administrators and policy on the above developmental issues where changes may be met. Further similar studies should be planned on a wider scale.

KEYWORDS

Psychological Wellbeing; Stress; Depression; Emergency Physicians.

INTRODUCTION

Wellbeing is a condition of holistic health in all its dimensions: physical, cognitive, emotional, social & spiritual. The World Health Organization (WHO) define health as "a state of complete physical, mental, and social wellbeing and not merely the absence of disease" that makes an individual or group to realize aspirations, satisfy needs, and to change or cope with the environment".[1]

Working in the Emergency Department involves high intensity of workload, working alone, lack of social support and free time, unsociable roster, violent, abusive, demanding or seriously ill patients, etc. (Williams *et al* 1997) which may alter physical and mental health of Emergency physicians. Several previous studies have found that these psychosocial risk factors not only affect the physical and psychological well-being of Emergency Physicians, but also led to the compromise in the quality of patient care (Visser *et al* 2003 Burke and Richardsen 1990[13], Richardsen and Burke 1991[14]).

Stress or Burnout amongst health care workers is characterized by emotional exhaustion, depersonalization and decreased personal accomplishment (Schaufeli 1999) which appears after a certain period of exposure to above psychosocial risk factors rather than personal factors. Work-related stress has been implicated as a major contributing factor to growing job dissatisfaction, burnt-out and

lack of initiative to explore newer specialties among doctors.

The aim of our study was to evaluate the level of psychological wellbeing of Emergency Physicians working in India and identify factors that affect psychological wellbeing. The identification of the psychosocial risk factors will help in developing coping strategies and outline preventive measures that can be useful to improve the health and quality of life of Emergency Physicians of India.

MATERIALS AND METHODS

Design and sample

We did a questionnaire based cross-sectional survey on Emergency Physicians working in multispecialty hospitals across India that have a fully operational Emergency Department and accredited by Society of Emergency Medicine of India (SEMI). A total 333 Emergency Physicians from 20 different hospitals across India were contacted, of which 195 Emergency Physician replied to the questionnaire (n=195, response rate=58.55%).

Data collection

The questionnaire was designed to elicit information about socio-demographic characteristics, sources and level of stress and depression by a standard depression screening tool (Beck depression inventory-Modified), coping mechanisms, and their future plans about remaining in the speciality. 'Ethical Committee' approval was obtained for the study from the central ethical committee of Peerless Hospital and B.K. Roy Research Centre.

The questionnaire was sent to the Emergency Physicians working in India by e-mail. Consent was sent with the questionnaire which the participants filled before the study questionnaire.

Statistical analysis

The questionnaire contained 20 questions on the factors causing stress and 22 questions on Depression. Range of Score for both Stress and Depression was 0.5 to 4.5 depending on the severity of stress and depression. The scores were interpreted as follows 0.5 to 1.5: little of the time, 1.6 to 2.5: Some time, 2.6 to 3.5: Good Part of the time, and 2.6 to 3.5: Most of the time. The first step in the data analysis was to examine the association between each independent variable and each outcome measure. Kruskal-Wallis rank sum test and Wilcoxon-Mann-Whitney test was the Statistical test used during analysis. Correlation coefficients calculated using Spearman rank correlation coefficient (Table No 1 & 2). All computations and statistical analysis are done using MS Excel and R software.

RESULTS AND DISCUSSION

Participant characteristics

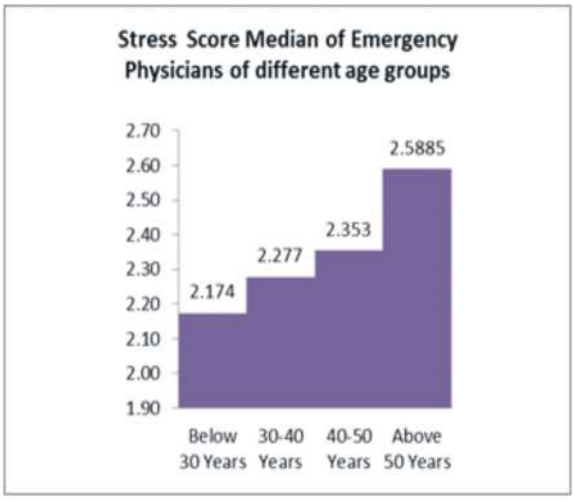
The demographics of the participants are given below in Table I.

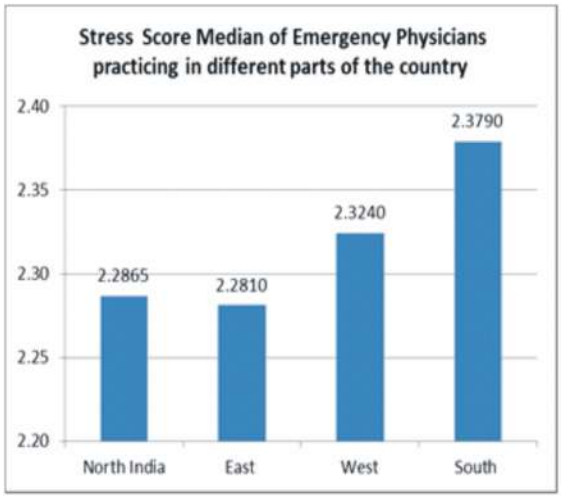
Table I: Demographics of the Participants

Participant demographics		(n =195)
Age (years)	Below 30 years	59
	30 – 40	85
	40 – 50	33
	Above 50 years	18
Marital Status	Single	96
	Married	99
Gender	Male	152
	Female	43
Place of Practice	North India	46
	East India	75
	West India	46
	South India	28
Years of Practice	1-2 Years	44
	2-4 Years	74
	4-6 Years	57
	> 6 Years	20
Place of living	Urban area	162
	Semi-Urban area	33

Analysis of stress levels

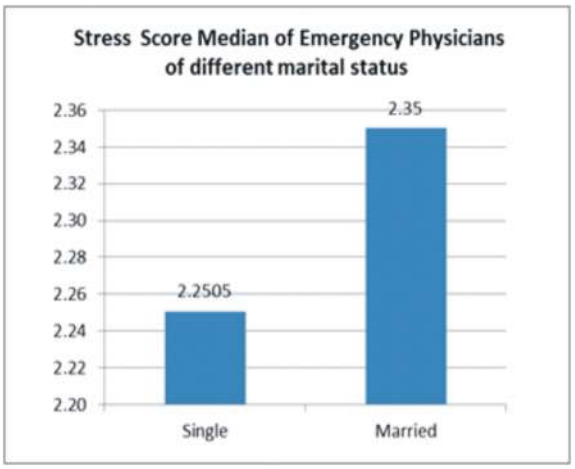
In our study 83.08% of all the respondent Emergency Physicians (EP) had moderate stress (stress score 1.5 to 2.5) and 16.92% suffered from severe stress (scores 2.5 to 3.5). We found that stress scores increased with age with a significant rise after the age of 40 years (p-value 0.00925 Wilcoxon-Mann-

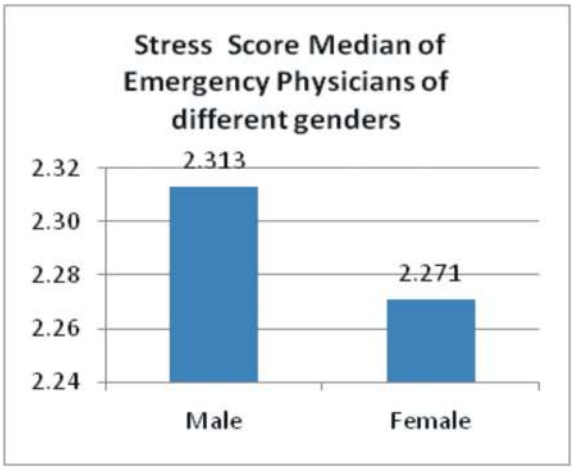


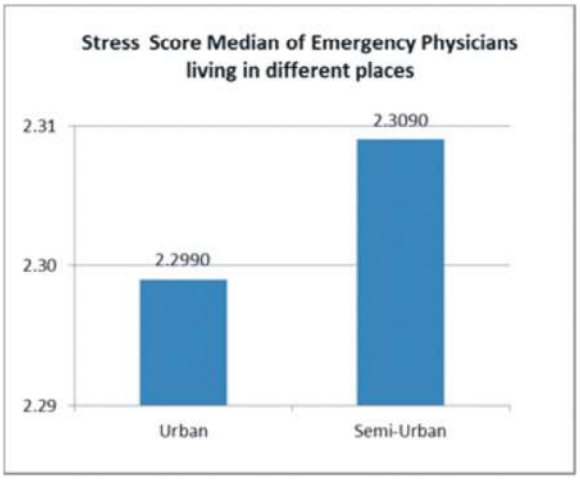


Whitney – one sided test). Stress scores of EPs practicing more than 6 years were significantly higher than their younger peers (p-value 0.0023 using Kruskal-Wallis rank sum test – two sided). Stress scores of married EPs were more than unmarried (p-value 0.0002 with Wilcoxon-Mann-Whitney - one sided test).

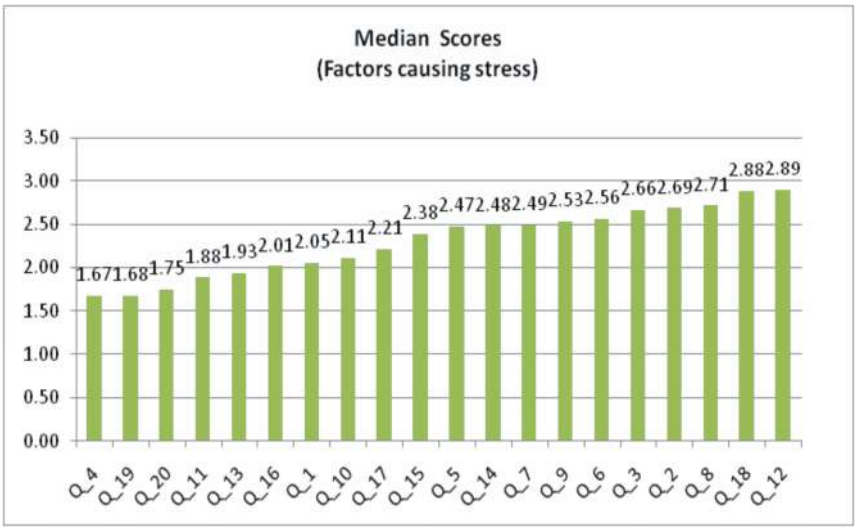
However, factors like gender, different parts of the country, urban and Semi-Urban areas, did not cause significant difference in stress level of EPs (5% level







Question on Factors causing Stress		Median Stress Score
1.	Emergency calls & Night calls	2.052
2.	Night shifts	2.685
3.	Working after sleepless night	2.658
4.	Time pressure	1.666
5.	Quantitative role overload	2.471
6.	Qualitative job overload	2.557
7.	Role conflicts	2.489
8.	Resource inadequacy	2.713
9.	Lack of carrier development	2.533
10.	Excessive paper works	2.112
11.	Medico legal issues	1.882
12.	Lack of perception of the speciality	2.894
13.	Dealing with problem patients	1.930
14.	Omnipresence of terminal illness & deaths	2.480
15.	Worrying about patient complaints & litigation	2.384
16.	Unpredictability at work	2.012
17.	Unrealistically high expectations	2.213
18.	Interruption of family & social life	2.879
19.	Physical environment & self-care	1.676
20.	Bureaucratic red tape	1.750



of significance using Wilcoxon rank sum test - two sided test and Kruskal-Wallis rank sum test – two sided) which leads us to believe that stress is more work related, rather than place or gender.

Many studies, done in the west, have shown high level of stress in doctors, with psychological morbidity ranging from 19% to 47 % (Wall TD *et al* 1997[15], Hsu K, Marshall 1987[16], Kapur N, Borill C, Stride C 1998[17], Firth Cozens J 1987[18]) when compared with a rate of around 18% for the general employed population (Firth Cozens J 2000[19]).

Previous studies (Gautam, 2001[20]) have also shown that such mental problems make doctors more susceptible to physical and emotional morbidity. Symptoms like fatigue, emotional burnout, marital and family discord, and even clinical depression regularly afflict more than half of these doctors and 60% of doctors suffering from stress have considered leaving the medical profession (Grenmy J 2006[21]).

The findings of our study suggest that stress is much higher amongst EPs practicing in India when compared with the western data.

Analysis of factors causing stress

In our study, the most confounding factors causing stress were lack of perception of Emergency Medicine amongst other hospital specialities and interruption of family & social life (median stress scores are between 2.88 and 2.89). Other major stress causing factors with median scores between 2.53 and 2.71 were night shifts, working after sleepless night, work overload, lack of career development and inadequacy of resources. Role conflicts, terminal illness & deaths encountered while on work, patient complaints & litigation (median scores are between 2.38 and 2.49) were also rated as important factors causing stress.

Emergency calls, unrealistically high expectations from patients, excessive paper works (median scores are between 2.05 and 2.21), lack of academic guidance (29=14.87%), mass casualties (21=10.76%) and insufficient pre hospital care (6=3.05%) were lesser confounding factors in causing stress amongst EPs.

Recommendations to reduce stress levels

Our questionnaire also contained questions on recommendation of the participants to help other Emergency Physicians in India to cope better with the challenges of their profession & to promote wellbeing. 65.12% EPs recommended to promote 8 hour shifts, regular discussion involving medical & administrative issues, regular work out & de addiction, adequate financial compensation as some methods to promote wellbeing. 34.87% recommended promoting pre-hospital care, proper planning for mass casualty & disaster and monthly refreshment party.

According to 94.3% of the participants, academic development and recognition of the specialty in India was the major need of the day and steps should be taken to do so with immediate effect. The participants felt the need of more Emergency Departments of International Standard and significant improvements in pre hospital Care in India were the priorities of development in the present scenario. 3.58% of the participants did not comment or recommend on any special plans for development, 4 EPs (2.05 percent) stated they were planning to leave the speciality.

CONCLUSION

Our study found that 27.69 percent emergency physicians were mildly depressed according to Becks modified depression inventory while majority, 72.31 percent emergency physicians were found moderate to severely depressed. We identified the following factors as major stress factors among Emergency Physicians in India: (1) Interruption of family and social life (2) Lack of perception of the speciality, while (3) Night shifts (4) Working after sleepless nights (5) Qualitative job overload (6) Resource inadequacy (7) Lack of carrier development. Other factors causing stress were thought to be: Lack of proper academic guidance, Mass casualties, Lack of perception of Emergency Medicine among other speciality and insufficient pre hospital care. We found that stress factor score, after the age of 40 years significantly increases with age. However depression after age of 30 years increases with age but significantly falls above 50 years age-group. Stress score of married emergency physicians were higher than the single emergency physician, while there were no significant differences in depression level. Stress score of emergency physicians of different genders, practicing in different areas and living urban or semi-urban areas were same. Stress score of emergency physicians practicing more than 6 years are significantly higher while depression level of emergency physicians practicing different years were same.

65.12 percent Emergency Physicians recommended : to promote 8 hour shift in ED ,regular case discussion involving medical & administrative issues, regular work out & de addiction , adequate financial compensation while rest 34.87 percent advised : to promote pre-hospital care, proper planning for mass casualty & disaster and monthly refreshment party as destressors. 94.3 percent felt that changes required to reduce stress were: academic development, gain recognition in India, develop Emergency Department of International Standard, develop proper Pre hospital Care in India as priorities.

A weakness of our qualitative result was that we were unable to expand upon the written responses because we did not conduct interviews allowing for follow up questions. Secondly, some of the responses and comments made were short and could have benefited from more detail. However we received a great variety of answers allowing us to reveal multiple factors related to emergency physicians psychological wellbeing.

Although certain limitations were met with the study, the researcher expects to draw attention of the Emergency Physicians as well as the administrators, policy makers, academician and researchers in related fields to resume further thorough research.

RECOMMENDATIONS

Emergency medicine is in still infancy in India, facing unexpected challenges every day. At this point of time the productivity of the emergency physicians is the most decisive factor as far as the success of proper emergency care is concerned. The productivity in turn is grossly dependent on the psychosocial wellbeing of the emergency physicians. The tendency in today's competitive medical environment is to emphasize financial incentives and to increase scrutiny of medical decision making to reduce costs and increase productivity. These mechanisms increase the tension in clinical decision making and can have unanticipated consequences in emergency physicians psychological wellbeing and performance.

Future research should target interventions at the organisational and institutional levels that have potential to decrease stress and depression levels and increase career satisfaction. Professional development programs and human resource policies are especially needed to address work-life conflict and job dissatisfaction. Training in stress management and healthy coping mechanisms should be explored for their potential to improve psychological health and to promote greater life balance.

Key Message

There are considerable number of factors cause stress and the high levels of depression amongst Emergency Physicians working in India. Cope-up strategies recommended by our study should draw attention of administrators and policy makers on the above developmental issues where changes may be met.

Key Message

There are considerable number of factors cause stress and the high levels of depression amongst Emergency Physicians working in India. Cope-up strategies recommended by our study should draw attention of administrators and policy makers on the above developmental issues where changes may be met.

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Case Report

Indian Journal of Emergency Medicine
Volume 1 Number 1 January - June 2015

ANILINE POISONING: PITFALLS AND CONSIDERATIONS IN THE MANAGEMENT OF CHEMICALLY INDUCED METHEMOGLOBINEMIA

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ABSTRACT

Aniline toxicity most frequently causes methemoglobinemia and haemolytic anaemia. We report the case of an 18 years old previously healthy male who presented to our Emergency Department (ED) with a history of bluish discoloration of fingers and mouth, weakness and uneasiness and subsequently diagnosed to have methaeglobinemia. On our literature search, we found that previous studies have shown that clinicians, in general, have a low index of suspicion of this potentially life threatening condition that often results in a delay in reaching the correct diagnosis and starting appropriate treatment. We take this opportunity to and discuss the possible pitfalls and considerations in the management of chemically induced methemoglobinemia.

KEYWORDS

Methemoglobinemia; Aniline; Methylene blue.

INTRODUCTION

Methemoglobinemia (MetHb) is a condition in which the Fe2+ (ferrous ion) of normal haemoglobin is oxidized to Fe3+ (ferric ion) which cannot bind with oxygen, and hence leads to decreased tissue oxygenation and impaired metabolism. Previous literature mention that Methemoglobinemia greater than 10% to 20% are often associated with symptoms and 70% is potentially life-threatening.[1-4]

Several causes of Methemoglobinemia have been identified, such as drugs (benzocaine, dapsone, anaesthetics), exhaust fumes from engines, herbicides and pesticides, and chemicals, such as nitrobenzene and aniline.[5-11] Methemoglobinemia can also be present as an inherited condition.

Methemoglobinemia is a potentially life threatening disorder, whose diagnosis depends on a high degree of suspicion. For proper diagnosis and management of Methemoglobinemia, clinicians should be aware of its pathophysiology, clinical presentation, and management modalities. Despite decades of experience, the guidelines for therapy for aniline poisoning are not well defined and are somewhat controversial.

We report a case of 18 years old with Methemoglobinemia that occurred in chemistry laboratory following skin exposure and inhalation of aniline and discuss the possible pitfalls and considerations in the management of chemically induced methemoglobinemia.

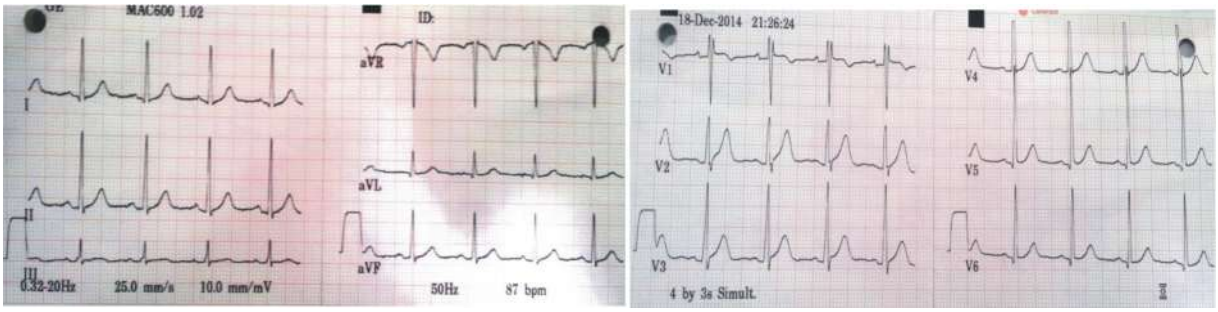
Case History

We report the case of an 18 years old previously healthy male who presented to our Emergency Department (ED) with a history of bluish discoloration of fingers and mouth, weakness and uneasiness. He was working at a chemistry laboratory when his friend, working with aniline, accidentally spilled the chemical and he inhaled the fumes. A small amount of the chemical also spilled on his body which he cleaned immediately. About two to three hours later, after going home, he started to feel uneasy and had two episodes of pre syncope along with generalised weakness and bluish discolouration of fingers and

Figure I: Central and Peripheral Cyanosis

Figure II: Colour of Blood and Urine

Figure III: ECG



mouth.

At the time of arrival to ED, patient was afebrile, conscious, oriented but complained of generalised weakness and uneasiness. The vital parameters revealed an SpO2 of 74 % in room air and 84% after high flow oxygen @15L/min with non rebreather mask, BP 120/70 mm of Hg, heart rate of 110/minute and random blood sugar 110mg /dl. Peripheral and central cyanosis was noted and the patient looked pale. The rest of his systemic examination was normal, and there were no remarkable findings.

ABG was done which revealed pH - 7.44, HCO-3 - 20.6, pCO2 - 30.8, pO2 - 296.1, SO2 - 99.9 %. Please note that the colour of his blood and urine were dark brown.

Parameters	On arrival	Progress	
	Day 1	Day 2	Day 3
pH			
PCO_2 (mm Hg)			
PO_2 (mm Hg)			
HCO_3 (mmol/ L)			
O2 saturation			
Methemoglobin			

Electrocardiogram and chest x-ray done in the Emergency Department were normal.

A clinical diagnosis of aniline toxicity presenting as Methemoglobinemia and haemolysis was made in the ED and the patient was treated supportively with IV fluids, high flow oxygen and ondansetron for vomiting. Metoclopramide was avoided as it was found to be one of the causes of methemoglobinemia from previous literature. The investigations sent from ED revealed the following results: haemoglobin (Hb: 11.6 g/dl), White blood cell count (12,040 cells/ cu mm), Urea (30 mg/dl) and Serum Creatinine (0.83mg/dl), and electrolytes (Na+: 140 mg/dl; K+: 5 mmol/L) were normal. His liver function tests and G6PD were normal (T. Bilirubin – 1.9, SGPT – 20, SGOT – 37, Alk. Phosphatase – 202). The blood methemoglobin levels came out as high as 38 % and reticulocyte count was 1.46% which confirmed the diagnosis.

Patient made a gradual recovery with the above treatment and his ABG and clinical cyanosis got better.

The following day methemoglobin level reduced to 6.1. The patient significantly improved over the next four days during his hospital stay. His cyanosis reduced centrally and peripherally and the oxygen saturation increased to 98% on air. He was discharged from the hospital on day 4 in a stable condition.

DISCUSSION

Aniline toxicity most frequently causes methemoglobinemia and haemolytic anaemia. If the physician is not aware of these effects of aniline, it can not only lead to missed or delayed diagnosis but also unnecessary investigations, and even therapeutic misadventure.[5,6] Harley and colleagues[6] described two neonates with acquired methemoglobinemia who had undergone cardiac

catheterization for persistent cyanosis, with normal findings, before being diagnosed as methemoglobinemia. Several previous studies[5, 6] have shown that clinicians, in general, have a low index of suspicion of this potentially life threatening condition that often results in a delay in reaching the correct diagnosis and starting appropriate treatment.

Methemoglobinemia is the most common cause of haemoglobin- specific cyanosis that can occur in congenital and acquired forms. Acquired methemoglobinemia result from an increase in the rate of oxidation of haemoglobin to methemoglobin. Some of the important causes of this condition are amyl nitrite, aniline, anaesthetics (like benzocaine, lidocaine, prilocaine, articaine, cetacaine) bismuth subnitrate, dapsone, nitroglycerin, p-aminosalicylic acid, phenytoin, primaquine, pyridine, silver nitrate, and sulfonamides. Amongst drugs, aniline derivatives, like lidocaine, prilocaine, and nitrites are the most common causes of methemoglobinemia.[7]

The clinical signs of methemoglobinemia are a result of the inability of methemoglobin to bind oxygen, causing a state of functional anaemia, leading to decreased tissue oxygenation and acidosis.[8] The hallmark of methemoglobinemia is central cyanosis classically described as "chocolate colored." The cyanosis usually appears when methemoglobin concentrations are > 15%. Symptoms of methemoglobinemia are dependent on the percentage of methemoglobin present in the blood (Table I).[9,10]

In methemoglobinemia, pulse oximetry cannot accurately assess oxygen saturation[11,12] because the two light wavelengths emitted by the pulse oximeter (usually 660 nm and 940 nm) are absorbed equally by methemoglobin regardless of the relative amounts of oxyhemoglobin and deoxyhemoglobin. Thus, the pulse oximetry does not sense hypoxemia when there is an increased concentration of methemoglobin and will overestimate the oxygen saturation. As found in previous studies[9], methemoglobinemia > 30% gives oxygen saturation (SpO2) of maximum of 85% which is not affected by oxygenation, as in our patient.

ABG analysis may show metabolic acidosis due to tissue hypoxia. However, arterial oxygen tension is normal or falsely high, as in our patient, since it detects the dissolved oxygen and not the oxygen bound to hemoglobin.

As evident from above discussion, both pulse oximetry and ABG are unreliable in detecting methemoglobinemia and a very high index of suspicion is required to diagnose this condition. A simple clinical test to diagnose methemoglobinemia is to place some blood on a paper towel and expose it to oxygen.[13] Dark brown blood that does not turn red on exposure to air/ oxygen is suggestive of methemoglobinemia. [14]

The gold standard test is co – oximetry which actually measures the various forms of hemoglobin in the blood and will not only provide a more accurate oxygen saturation but also measure methemoglobin level. However, this test is not easily available everywhere.[14]

Once methemoglobinemia is diagnosed or suspected, treatment should be initiated immediately.

Supportive care as per standard ABC protocol, supplemental (100%) oxygen, and adequate hemodynamic support should be implemented. Further absorption of the responsible toxin should be prevented by standard decontamination measures. Once the toxic agent has been cleared, the methemoglobinemia will resolve in most cases within

Table I

% MetHb	Symptoms
< 20%	usually asymptomatic
20% - 50%	Weakness, malaise, nausea, vomiting, headache, dyspnea, and tachycardia.
50% - 70%	Lethargy, dizziness, cardiac arrhythmias, stupor and coma.
> 70%	high incidence of mortality

36 hours, due to the normal reducing mechanisms.[14] Activated charcoal in repeated doses may be administered in the case of oral ingestion of drugs that undergo enter hepatic circulation e.g. Dapsone where activated charcoal may be given every 4 to 6 hours for 4 days.

Emergency department blood tests should include routine tests with special emphasis to rule out any evidence of hemolysis (hemoglobin, blood smear, Heinz body staining, and serum haptoglobin). Myocardial Ischemia and dysrhythmias should be looked for by continuous monitoring and urgent electrocardiogram. In asymptomatic or mild cases no additional therapy is necessary, other than close observation and symptomatic management.

Specific therapy with intravenous methylene blue is recommended when methemoglobin concentration exceeds 30% to 40% or evidence of tissue hypoxia, anemia, cardiovascular, or central nervous system symptoms.

Methylene accelerates the action of enzyme NADPH-methemoglobin reductase as a cofactor. In the reaction, methylene blue is oxidized into leukomethylene blue by NADPH-methemoglobin reductase which then donates an electron to methemoglobin resulting in its conversion to haemoglobin.[7] The therapeutic dose of methylene blue is 1 to 2 mg/ kg of 1 % solution administered intravenously which may be repeated after 1 hour in the case of inadequate response. A marked reduction in the methemoglobin concentration within 30 to 60 minutes. Common side effects of Methylene blue are nausea, diarrhoea, oral dysesthesia, dyspnoea, excessive perspiration, retrosternal chest pain, dizziness, tremor, tachycardia, hypertension, and urinary tract irritation. Methylene blue may discolour skin and mucous membranes and produce blue green discoloration of urine.[14] Non specific ST-T wave changes and decrease in R wave amplitude may be seen in ECG[14] In patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency, Methylene blue can cause haemolysis. Doses above 15 mg/kg can cause a life-threatening refractory methemoglobinemia which has currently no treatment. So, Methylene blue should be used with caution.

Several alternative therapies have been suggested for treating Methemoglobinemia though the efficacy of these modalities has not been proven. Ascorbic acid (300 to 1,000 mg/day intravenously in three to four divided doses) provides no enzymatic reduction of methemoglobin and may be tried, but is slow and probably has little role in acute acquired methemoglobinemia.[5,6,8] Cimetidine inhibit cytochrome P-450, and decreases methemoglobin fractions by 25%[14] thus providing some protective effect in an acute overdose In severe cases, blood transfusion or exchange transfusion[5,6,8,9] are recommended. Exchange transfusion not only replaces methemoglobin but also corrects haemolytic anaemia and removes the absorbed toxin. Haemodialysis[14] may be considered to help remove the compound. Some authors also recommend intravenous dextrose[14], because it is required for the production of NADPH via the hexose monophosphate shunt.

CONCLUSION

The appearance of cyanosis and/ or a decrease the saturation levels on pulse oximetry in patients exposed to aniline should alert clinicians to the possibility of methemoglobinemia. It should be suspected if there is sudden development of cyanosis which is unresponsive to 100% oxygen. Diagnosis of methemoglobinemia is confirmed by cooximetry. The condition usually does not require any specific treatment except for supportive care and removal of the inducing agent. In severe cases, Methylene blue may be used as the specific antidote. Alternative therapies like blood transfusion, exchange transfusion, haemodialysis or hyperbaric oxygen have been advocated by authors, but data is lacking.

Key Messages

This case report illustrates that the appearance of cyanosis and/ or a decrease the saturation levels on pulse oximetry in patients exposed to aniline should alert clinicians to the possibility of methemoglobinemia.

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Case Report

Indian Journal of Emergency Medicine
Volume 1 Number 1 January - June 2015

AORTO ARTERITIS WITH EXTENSIVE VASCULAR CALCIFICATION IN A MALE WITH PRIMARY HYPOGONADISM

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ABSTRACT
We report the case of a male with Aorto arteritis (Takayasu's) with extensive calcification of aorta and its branches. Extensive calcification of the arteries is unusual in Takayasu's arteritis. A variety of mechanisms may play a role in this phenomenon of calcification, and we attempt to elucidate some of them.

KEYWORDS
Vasculitis; Aortoarteritis; Vascular calcification; Takayasu.

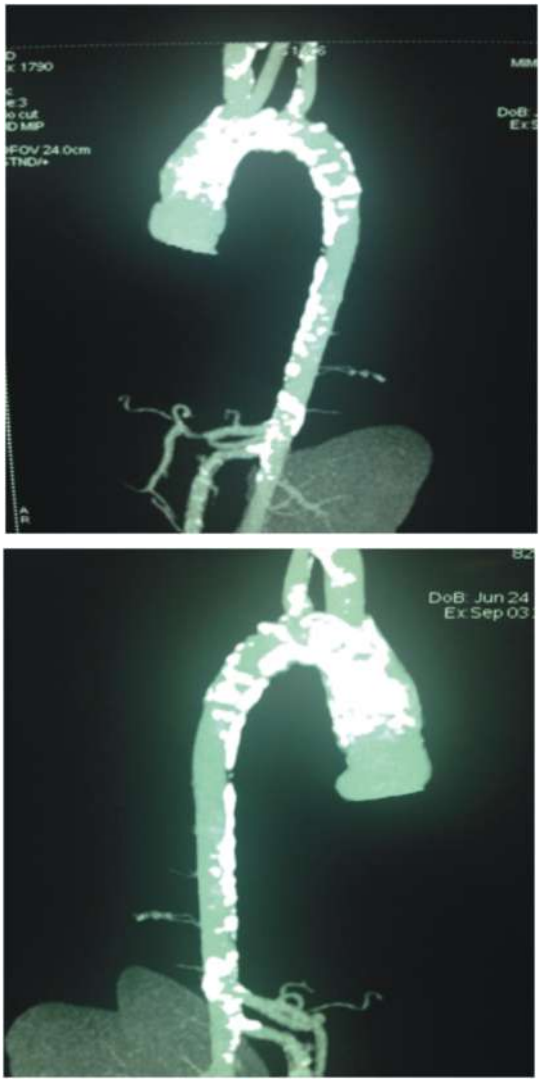
Case Report

A 38 year old male, working in a construction company as a mason for 22 years from Calicut presented with history of insidious onset slowly progressive intermittent claudication in both lower limbs for the last three years. At presentation it has reached a stage that he had to rest every 5 minutes during walking. He married twice but had no children from either marriage. He had consulted for infertility and was found to have a low sperm count. He also had history of abdominal pain following meals suggestive of mesenteric ischemia and history suggestive of migraine with aura for the last 10 years. There was no history of pain in the buttocks or in upper limb; there was no history of impotence, chest pain, palpitation or syncope. He had no history of arthritis, fever, photosensitivity, flank pain, hematuria, jaundice or vomiting. He was a non smoker but used to drink alcohol 200 ml of brandy almost 5 days a week but stopped since the last eight months. His elder brother and sister have no children the cause of which is not known.

On examination he had sparse facial, axillary, pubic and body hair with gynecomastia and atrophic testes. He had a coarse facies with protruded jaw. Skin and nail changes suggested early chronic liver disease. Pulse rate was 68/mt regular, normal in volume and character, no radiofemoral or radioradial delay. Upper limb pulses were normally palpable, but both femorals were feeble and Popliteal, posterior tibial and dorsalis pedis were absent in both lower limbs. Bruit could be heard over femoral, renal and carotid arteries. Blood pressure in the right upper limb was-120/80mm

Fig 1: MR angiography

Fig 2 & 3: CTAngiogram: Showing extensive calcification of the whole of aorta and its branches



Hg and left upper limb was 116/74mmHg. Cardiovascular system examination revealed an ejection systolic murmur in the aortic area. Other systems were within normal limits. Fundus examination was normal. Gastrointestinal, Respiratory and CNS examination were normal.

Investigations

Hb-11.7g/dL, TLC-7200/mm^3 DLC P74 L24 M2, Platelet count was 2.08 lakh/mm^3 . Hct-34.8%, ESR-23mm in first hour, Blood sugars, renal function, liver function and electrolytes were normal. Urine did not show any sediments or proteinuria. Serum Calcium was 9.4 mg/dL, Phosphate 3.4mg/dL and Alkalinephosphatase was 129IU. ECG was normal;

Fig 4: X-ray showing vessel calcification

Parathormone level was normal-17.7ng/L(15-65). There was no dyslipidemia and the screening for infections like Tuberculosis HIV, HBsag and HCV were negative. ANA and APLA were also negative in low titers. Serum Cortisol and Thyroid functions were normal. Serum Testosterone was low-0.518ng/ml(2.8-8.0), with high FSH-39.9mIU/ml(1-14) and LH-28.5mIU/ml(0.7-7.4) and normal Prolactin-9.2ng/ml(2.5-17.0). Semen analysis did not show the presence of sperms. Chest X-RAY was normal and the Mantoux test was negative. USG whole abdomen findings & Doppler were unremarkable except, early renal parenchymal disease was echo cardiography done.

MR Angio reported as: showing minimal luminal irregularity but no definite opinion could be given.

MRAngiogram Report

Minimal luminal irregularity involving distal aspect of right superficial femoral artery, Otherwise normal. Since he had definite features of large vessel disease involving both lower limbs and clinically mimicking coarctation of aorta we went ahead with CT angiogram.

Considering possibility of Takayasu only a magnetic resonance angiogram was done but to our surprise it was inconclusive, since the clinical suspicion was so

high that we went ahead with CT angiogram, which revealed extensive calcification of ascending aorta, arch, descending aorta, branches, extending till anterior tibial and dorsalis pedis hence confirming our initial clinical diagnosis. Calcification was also noted in the superior mesentric artery-probably the reason for the postprandial abdominal pain. Retrospectively on reviewing the x-ray foot which was taken elsewhere for heel-pad thickness when someone suspected acromegaly, since he had coarse facial feature- it showed calcification of the arteries

DISCUSSION

This middle aged male had typical history and findings of large vessel vasculitis mimicking Takayasus arteritis. The only other disease we wanted to excude was coractation of aorta. Clinically it cannot be atherosclerotic vascular disease since such extensive involvement to the extent to produce calcification and still not having angina and that too with no Dyslipidemia, is unusual. If at all it has to be an inflammatory disorder followed by calcification in the given clinical setting. He also had features of hypogonadism clinicaly which on subsequent investigations was found out to be primary hypogonadism with absent sperms in semen analysis. His siblings also have no children. So we attribute an inherited cause for the hypogonadism. The final diagnosis was thus large vessel vasculitis, Takayasu arteritis with extensive calcification- with primary hypogonadism. This case demonstrates that while mechanisms of vascular calcification are poorly understood, inflammation per se might be sufficient to mediate increased mineral stress leading to vessel calcification, even in the absence of hypercalcmia or hyperphosphatemia or renal impairment. The relation with primary hypogonadism is not previously reported in literature. One study has shown patients with hypogonadism have abnormal calcium metabolim leading to increased bone resorption and increased urinary excretion of calcium[3]. This may have also contributed to the extensive calcification in his arteries. We could get only three reports from the Literature search on such vascular calcification.

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Indian Journal of Emergency Medicine
Volume 1 Number 1 January - June 2015

JOURNAL CLUB

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INTRODUCTION

Literally a journal club is defined as "A group of individuals who meet regularly to critically evaluate recent articles in the academic literature, generally of some branch of science or philosophy. Journal clubs are usually organized around a defined subject in basic or applied research."[1]

Individuals actively involved in medical education consider journal clubs vital in bridging the gap between medical education and clinical practice.[2] According to Eugene Lloyd, of Bristol University, "Journal clubs are a good way of introducing students to science as a dynamic experimental subject and to illustrate scientific reasoning." They encourage students to evaluate experimental evidence instead of simply reproducing facts described in didactic lectures.

Having said that a journal club should not necessarily be a closed room discussion rather it can be discussed over a variety of platforms. A good medical magazine or journal could be one of them. Nowadays a new concept called "virtual journal club" has been in the talk which is a nice approach to expand our practice of evidence based medicine. Critical appraisal of any research article and to use the derived knowledge in day to day practice is the main motto.

Journal clubs are also an accessible way of supporting lifelong learning for medicos. They help us to keep up to date with relevant literature and give us the confidence to formulate our own opinion on topics through critical analysis of the literature. Discussions and questions that may arise as a result can help us to understand scientific concepts and relate them to clinical practice, both essential to optimize patient care.

In a nutshell a journal club is needed to get the following points fulfilled:

- Learn about our own field
- Keep abreast of new developments in that particular field
- Foster informal discussion and interaction
- Help students develop presentation skills

This section is being dedicated to provide some evidence based medical knowledge to the emergency medicine people so that they can use that knowledge in their day to day life thus helping them to increase their clinical acumen. I hope readers enjoy this section.

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Indian Journal of Library and Information Science	3	8000	600
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Indian Journal of Mathematics and Statistics	2	5000	200
Indian Journal of Medical & Health Sciences	2	6000	120
Indian Journal of Obstetrics and Gynecology	2	5000	200
Indian Journal of Pathology: Research and Practice	2	10000	915
Indian Journal of Plant and Soil	2	5000	1700
Indian Journal of Preventive Medicine	2	6000	250
Indian Journal of Reproductive Science and Medicine	4	3000	180
Indian Journal of Scientific Computing and Engineering	2	4000	280
Indian Journal of Surgical Nursing	3	3000	70
Indian Journal of Trauma & Emergency Pediatrics	4	8500	302
International Journal of Agricultural & Forest Meteorology	2	8000	800
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International Journal of History	2	6000	500
International Journal of Neurology and Neurosurgery	2	9000	276
International Journal of Political Science	2	5000	400
International Journal of Practical Nursing	3	3000	70
International Physiology	2	6500	240
Journal of Animal Feed Science and Technology	2	4000	280
Journal of Cardiovascular Medicine and Surgery	2	9000	238
Journal of Orthopaedic Education	2	4500	190
Journal of Pharmaceutical and Medicinal Chemistry	2	15000	350
Journal of Psychiatric Nursing	3	3000	70
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Practitioner Section

Indian Journal of Emergency Medicine
Volume 1 Number 1 January - June 2015

STATINS FOR ALL -TRUTH OR HYPE

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ABSTRACT

Rapid advances have been witnessed in the understanding and management of dyslipidemia which has led to widespread use of statins. Statins have been proved to be beneficial in primary prevention of cardiovascular diseases and in secondary prevention of cardiovascular diseases and stroke. Preliminary studies have also documented benefit of statins in lipid independent conditions. The rate of occurrence of adverse events determines the risk benefit ratio of statins in low risk individuals. Hence, the irrational overuse of statins is a matter of concern. Statins for all will be a reality only if backed by clinical reasoning and quality evidence.

KEYWORDS

Statins; Primary prevention; Cardiovascular diseases.

INTRODUCTION

In the last decade, rapid advances in understanding and management of dyslipidemiahas led to irrational use of statins, which is a matter of concern. "Statins for all - truthor hype", is a topic for debate. Clinicians should identify cardiovascular risk factors, calculate the risk of a cardiovascular event, enforce life style changes and then initiate or intensify statins rather than starting statins for all.

History and growth of statin

The search for cholesterol lowering drug dates back to 1971 when efforts of Akira Endo, a Japanese biochemist led to the identification of a molecule mevastatin (ML-236 B) from the fungus Penicilliumcitrinum which had HMG CoA reductase inhibition property. The same compound had been isolated in 1976 from Penicilliumbrevicompactum, named compactin. It was identified as antifungal but its HMG CoA reductase inhibitor property was not realised. Due to adverse effects and mortality in experimental animals, Mevastatin could not clear clinical trials and was never marketed. P Roy Vageloscontinued the search and finally succeeded in isolating lovastatin (mevinolin, MK 803) in 1978 from Aspergillusterreus and it was the first statin to be marked in 1987 as mevacor.

With establishing of lipid hypothesis which clearly defined the relation between cholesterol and cardiovascular disease(CVD), growing public awareness regarding good and bad cholesterol and the building confidence among doctors that statins were effective in preventing cardiovascular disease led to many pharmaceutical companies manufacturing, marketing and promoting their own statins like simvastatin, atorvastatin, cerivastatin , pravastatin, rosuvastatin, fluvastatin and pitavastatin. Cerivastatin was very potentbut was withdrawn form market in August 2001 due to risk of serious rhabdomyolysis. Some naturally occurring statins are found in oyster mushroom and red yeast rice[1] but their efficacy needs to be scientifically proved.

Mechanism of action

Statins are lipid lowering drugs which act by inhibiting the hepatic conversion of HMG – CoA to L - mevalonate by inhibiting the enzyme HMG CoA reductase thereby preventing subsequent cholesterol,

ubiquinone and dolichol dependents effects. It also reduces low density lipoprotein (LDL), plasma triglycerides and apolipoprotein B. There is some evidence that it increases high density lipoprotein. [2].

Statins have action apart from lipid lowering activity in the prevention of atherosclerosis. There is evidence to show that statins prevent cardiovascular disease by improving endothelial function, modulating inflammatory response, maintaining plaque stability and preventing thrombus formation. Statins anti-inflammatory properties is exemplified by reduced plasma concentrations of the inflammatory cytokines like Tumour Necrosis Factor α and Interleukin 6.There is considerable evidence that statins may activate endothelial nitric oxide synthase (eNOS) but there is limited evidence of its effect on induciblenitric oxide synthase (iNOS). Further studies are required to establish the interplay between statins and free radical formation and their potential role in sepsis.

Statins and primary prevention of cardiovascular disease (CVD)

A literature based meta-analysis of randomised controlled trials including 65,229 participants observed that statin therapy for an average period of 3.7 years had no benefit on all-cause mortality in a high – risk primary prevention population.[3] However, methodological deficiencies were a limitation as it was a retrospective research. Heterogeneity in demographic and clinical characteristics of subjects enrolled,the type, dose and duration of statin used and bias in reporting adverse events was also a factor to influence the conclusion.

Effectiveness of statins in primary prevention of CVD has been evidenced and most guidelines recommend statin use for high risk subjects in reducing fatal and non-fatal vascular events. Baseline estimated cardiovascular score and LDL thresholds are taken as indicators for initiating statin therapy for primary prevention by various societies including European Society of Cardiology and European Atherosclerosis society. Adults with LDL cholesterol greater than 190mg/dl are recommended for primary prevention by American College of Cardiology and American Heart Association . Adults with an estimated 10 years risk of developing CVD of 10% or more should be initiated on statin therapy, as recommended in the draft guidance of National Institute for Health and Clinical Excellence (NICE) 2014.[4]

Society of General Internal Medicine in its meeting in April 2014 discussed a study which made the observation that patients on statins for dyslipidemia did not adhere to life style modifications. They consumed more fat and calories and did less physical activity as compared to non-statin users. Clinical practice guidelines also recommend lifestyle modification before initiating statin therapy as it would also offset the risk of developing diabetes mellitus. The drug lifestyle interaction maybe the explanation as to why the striking reductions upto 30% to 50% in LDL cholesterol does not translate to proportionate health benefits.

Statins and secondary prevention

The effect of statins in lowering LDL – cholesterol (LDL-c) and associated cardiovascular risk has been proved beyond doubt in both sexes and across all age groups. Use of statin has been associated with reduction in myocardial infarction (fatal and non-fatal), unstable angina and ischemic stroke in patients with CVD , Acute coronary syndrome, diabetes mellitus(DM), hypertension, metabolic syndrome or previous history of ischemic strokes.

Statins can reduce LDL-c by 70mg/dl (1.8 mmol/L) which can lead to an estimated 17% reduced risk of stroke and 60% reduction in cardiac events[5] along with decreased revascularisation procedures. National Cholesterol Education Program Adult Treatment Panel (NCEP-ATP) recommends a target of LDL <100mg/dl for those with 10 years CVD risk>20%, DM or clinical CVD. NCEP-ATP 2004 report set the LDL goal to<70mg/dl for those with established CVD and additional risk factors (risk factors for Metabolic Syndrome, CVD and DM). Guidelines from most of the cardiological societies recommend statin use for secondary prevention and are backed by evidence from randomised controlled trials.

Statins in NAFLD and NASH

Non-alcoholic fatty liver disease (NAFLD) can progress to non-alcoholic steato hepatitis (NASH). Statin use in NASH has been associated with reduction in aminotransferases in small studies but failed to show benefit in improving liver histology and reducing morbidity. Statins can be used to control hyperlipidemia which is frequently associated with NASH but its role as a therapy for NAFLD and /or NASH by itself is doubtful and warrants further research.

Statins in perioperative care

Beneficial effect of statins in preventing cardiac complications in non-cardiac surgery during perioperative period[6] and reducing risk of stroke in 'at risk' patients[7] has been reasonably proved but evidence from prospective randomised studies is required before advocating routine use of statins for perioperative cardiovascular risk reduction. Which statin, in what dose and for how long should be used also needs to be answered. However there is convincing evidence that patients already on statins should continue in perioperative period as it has better outcome. Sudden cessation of use is associated with increased morbidity and mortality[8].

Other uses of statins

Apart from its lipid lowering effect, statins also exhibit anti-inflammatory and pleiotropic effects and this has been explored in various diseases. There is evidence to show beneficial effects of statins on lipid independent conditions such as decreasing mortality rates in sepsis, rate of renal damage in diabetes mellitus, incidence & progression of dementia and Alzheimer's disease, rejection rates in organ transplantation, incidence of esophageal, gastric, colorectal and hepatocellular carcinoma, the risk of macular degeneration, inflammatory bowel disease and osteoporosis and reducing activity in rheumatoid arthritis. But as of now, statin use is not recommended for these indications and further prospective trials are required.

Side effects

Undoubtedly statins have obvious beneficial effects but they also have a number of side effects which cannot be ignored. The most severe side effects include extreme muscle pain, myopathy, rhabdomyolysis, increase in liver transaminases.The addition of a fibrate or niacin to statins further increases the risk of rhabdomyolysis. Increase in the risk of a haemorrhagic stroke [9] and diabetes mellitus has also been reported.[10] Other rare side effects include neuropathy, cognitive decline, pancreatic & sexual dysfunction.The rate of occurrence of adverse events determines the risk benefit ratio of statins in low risk population and is the reason forextensive debate on the incidence of side effects.

Beneficial effects of cholesterol

Cholesterol has always been addressed to as the culprit for all that is related to atherosclerosis & heart disease. But this is not the whole truth. Cholesterol has beneficial effect in regulating cell membrane permeability & fluidity. It is a precursor molecule for synthesis of vitamin D, steroid hormones and sex hormones. Thus statin also effect the synthesis of other molecules that have a beneficial effect in atherosclerosis & CVD. A question which needs to be answered is that whether cholesterol lowering is a double edged sword. Whereby on one hand CVD risk is being reduced but on the other hand inhibition of other by products from HMG CoA reductase pathway may increase CVD risk.

Future of statins

Nitric oxide releasing statins like nitro pravastatin[11] and nitro atorvastatin[12] are being researched. Improved vascular function and enhanced ability to decrease iNOS expression in LPS treated macrophages was observed. This effect could be beneficial in preventing endothelial damage in sepsis and is worthy of long term research.

CONCLUSION

Use of statins in low risk individuals would unnecessarily increase adverse effects without overall health benefit. Hence, statins for all is a truth only when backed by clinical reasoning and good

quality evidence.

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