

Telemedicine in Handling Medical Emergencies in India: Exploring Hidden Potential of Current Health Infrastructure

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Abstract

India being one of most populous country is moving towards in providing easy accessible and affordable health care to its citizens. In recent times, it has witnessed a transformation of emergency ambulance services which has saved more than a million lives in its urban and rural areas. COVID 19 pandemic has provided a unique opportunity to strengthen its healthcare infrastructures. MOHFW has legalized telemedicine in India in March 2020 which has provided an opportunity for doctors to provide consultation to patients who is in a remote part of country and for rural patients, getting consultation from specialist of choice from their homes. Recently, there has been a lot of focus in emergency medicine and NMC reforms made it mandatory for medical colleges to have a separate unit for this specialty. There is a need to combine telemedicine with emergency medical care in India as India is facing more than 2 million medical emergencies every year and in many of the cases, emergency medical care is needed immediately in the form of first aid advice and/or counselling to prevent possible complications. India has one of the world's highest internet users as well as India has one of the world's highest numbers of medical institutions which are producing more than 80,000 medical graduates every year. Now a day, India is witnessing growth in its telemedicine platforms available for its citizens. In moving next to strengthen its health infrastructure, all these dots can be combined effectively to create an ecosystem for dealing with medical emergencies via telemedicine.

Keywords: Telemedicine; MOHFW; NMC; Medical Emergencies; Health infrastructure; Pandemic; COVID 19, Ambulance service.

Key Messages: (Provide appropriate messages of about 35-50 words to be printed in centre box): Telemedicine could be transformative for rural health care in India. People can get consultation from top disease specialist without visiting nearby cities, also first aid consultation for medical emergencies which can save many lives annually.

Introduction

India is the second most populous country in the world with 1.39 billion people.¹ It has expanded its pre-hospital and emergency care in recent time to prevent deaths annually. India has created world's largest ambulance service and the first of its kind in the developing world, the system, known as GVK EMRI 108 service which was reported to save more than 1.4 million lives in its first 10 years (2005-2015).² As per 2018 WHO estimates, coronary heart disease (CHD), stroke (CVAs) and road traffic accidents (RTAs), are the most commonly cited causes of death and disability in India.³

Table 1: World Health Organization total death counts in India. Final Deaths: 2018.

Cause of death	No. of deaths
Coronary Heart Disease (CHD)	1,608,651
Stroke	706,198
Road Traffic Accidents (RTAs)	299,091
Suicide	215,872
Falls	206,345
Drowning	63,969
Poisonings	31,310

Many of the deaths due to CHD, RTAs, suicide, falls, drowning and poisonings are preventable if appropriate first aid can be provided on immediate basis and patient can be hospitalised as soon as possible as in most of the scenarios every second counts and timely hospital care can save many lives.

Currently, the use of telemedicine in India is encouraging. COVID-19 pandemic has provided an opportunity for establishment and expansion of telemedicine services in India. Current MOHFW telemedicine guideline empowers doctors to provide emergency consultation to the patient in

forms of first aid consultation, life-saving measure, counselling and advice on referral.⁴

About new telemedicine guidelines

As per Telemedicine guidance issued by MOHFW, in situations where alternative care is not present and teleconsultation is the only way for timely care, telemedicine consults for immediate assistance or first aid advice can be provided to patient. Consultation will consist of first aid, life-saving measure, counselling and advice on referral only.

“Role of health worker in handling of medical emergency via telemedicine platforms”.

RMP should do quick assessment about patient's condition based on available information and by using his professional discretion, can decide need for emergency care. If the condition of the patient needs emergency intervention, then advice for first aid/immediate referral as appropriate is to be provided.

The Health Worker will provide information about the medical condition of the patient to the RMP. Based on information shared, if the RMP identifies it as an emergency condition and needs urgent care, he/she should advise Health Worker to give first aid to patient for immediate relief and guide for referral.

Protocol for RMP for handling medical emergency via telemedicine platforms

- Quick assessment of patient's condition
- Based on professional discretion, advise for first aid/counselling/facilitate referral.
- Ask to get in-person care at the earliest.⁴ Suggestions to NMC/MOHFW

Common medical emergencies in India and first aid advice

Table 2: Common medical emergencies in India and first aid advice in telemedicine scenario.

Condition	Online quick advice before referral for saving life or preventing complications
Cardiac arrest	<ul style="list-style-type: none"> • Ask the attendant to check pulse (absent pulse), hear sounds (absent heart sounds), responsiveness of patient (unresponsiveness), breathing (absent breathing or agonal gasps). • Ask attendant to start CPR (30:2) - 30 chest compression with 2 rescue breaths. • Ask attendant to Call the ambulance or rush to nearby hospital immediately.⁵
Heart Attack/ Chest Pain	<ul style="list-style-type: none"> • Sublingual Nitroglycerine 0.3-0.6 mg or buccal spray-1 to 2 sprays under tongue, give 3 doses at 5 min apart OR Aspirin tablet 300 mg stat/clopidogrel 300 mg stat • CPR if pulse is absent/no breathing/patient is unresponsive. • Call the ambulance or rush to nearby hospital immediately.⁵
Stroke	<ul style="list-style-type: none"> • Ask the attendant to call ambulance immediately after disconnecting the call or rush to the hospital. • Keep patient lying on one side with their head slightly raised and supported in case they vomit. • Check to see if they're breathing. If they're not breathing, perform CPR.⁵⁻⁶

- Heat Stroke
- Immediately shift the patient out of the heat, remove excess cloths, and cool them using whatever means possible.
 - Asking the person to be in a tub of cool water or a cool shower
 - Sponge with cold water
 - Put ice packs or cool, wet towels on the neck, armpits and groin
 - Ask the person drink cool water to rehydrate.
 - Stop cooling measures once a temperature of 36-38° celsius is achieved.
 - If symptoms persist >30 min then call the ambulance or rush to nearby hospital.⁵
- Hypoglycaemia
- If patient is unconscious then call the ambulance or rush to nearby hospital.
 - If patient is conscious then ask the attendant to give 2 spoonful sugars in water, also take sweet, biscuit, sweet drink (fruit juice)
 - Check blood sugar 10-15 minutes later, if hypoglycaemia persists then repeat above measures 1-3 times.⁵
- Near drowning & drowning
- Ask attendant to give 5 initial rescue breaths then start chest compressions
 - If not relieved then call the ambulance or rush to nearby hospital.⁵
- Superficial skin burns
- Cooling with tap water not more than 5 minutes.
 - Ask the attendant to cover the burned area by placing a clean cloth or bandage that's moistened with water.
 - Separate fingers and toes with dry and sterile, non-adhesive bandages, If hands and feet are burned.
 - Remove clothing, rings & other items from burned areas.
 - Prescribe NSAID for pain relief and anti-histamines for itching.
 - Rush to the hospital.^{5,7,8}
- Epistaxis
- Ask patient to sit or stand with head tilted forward (bend forward at waist)
 - Pinch the nose- grip the soft part of both nostrils with finger and thumb and squeeze for 10 min then release.
 - If bleeding continues, repeat the process 2 more times for 10 min each.
 - Rush to the hospital if bleeding does not stop.⁵
- Foreign body in Ear, Nose & Eye
- For Ear
- Try using gravity; tilt the head to the affected side to dislodge the object.
 - If insect, tilt the head upward.
 - Not relieved then rush to nearby hospital.
- For Nose
- Occlude unaffected side of nose by a finger then give a nasal air blow outside from affected side.
 - Not relieved then rush to nearby hospital.
- For Eye
- Immediately flush the eye with water.
 - Keep your eye open while flushing with water, continue 15-30 min.
 - If not relieved, rush to a hospital.⁵
- Chemical Eye Injury
- Immediately flush the eye with water.
 - Keep your eye open while flushing with water, continue 15-30 min.
 - After flushing, rush to a hospital.⁵
- Chemical burn (acid or alkali burn)
- Thoroughly flood the part with water.
 - Rush to the hospital immediately.⁵
- Electric shock and lightening injury
- Do not go near the injured person if he or she is still in contact with the electrical current.
 - Call local emergency number in case the source of the burn is a high-voltage wire or lightening.
 - Don't go near high-voltage wires until the power is switched off. Stay at least 20 feet away.
 - Switch-off the source of electricity, if possible.
 - Use a dry, non-conducting object made of cardboard, plastic or wood to shift the source away from you and the person.
 - Start CPR in case no signs of breathing.
 - Cover burned areas with a sterile gauze bandage or a clean cloth.
 - Rush to the hospital immediately.^{5,9}

- Choking
- If attendant is available
- Instruct victim to cough, lean forward
 - If cough becomes ineffective, ask attendant to give up to 5 back blows to dislodge obstructing object to come out from mouth keeping patient forward leaning, supporting chest with one hand
 - If back blows are ineffective then give up to 5 abdominal thrusts
 - Continue cycle of 5 back blows and 5 abdominal thrusts until the object is coughed out
- If attendant is not available
- Place fist above naval
 - Leaning over a counter top of a chair and driving fist thrust towards upwards
- Children over 1 year of age
- Ask the attendant to tell child for coughing
 - Ask the attendant to bend the child over until the head is lower than the chest
 - Ask the attendant to use palm to deliver a firm blow between the shoulder blades.
 - Repeat the blows up to 5 times then try abdominal thrusts till obstruction clears.⁵
- Seizures
- Turn the person onto one side if he/she is unconscious.
 - Loosen tight clothes around neck
 - If they are awake, support them sit down in a safe place
 - If patient is at risk of falling or having a convulsive seizure or tonic-clonic seizure:
 - Lay them down on the floor.
 - Put something small and soft under the head or put something soft (such as a jumper) under their head, or cup their head in your hands, to stop it hitting the ground
 - Turn them on their side with their mouth pointing toward the ground. It will prevent saliva from blocking their airway and helps the person breathe easily.
 - Do not place any objects in their mouth
 - do not hold them down - allow the seizure to happen
 - Try to stop other people crowding around
 - If a person appears to be choking, turn them on their side. If they are not able to cough and clear their air passages on their own or are having breathing difficulties, start CPR and rush to the hospital or call ambulance immediately.
 - if the seizure goes on for more than 5 minutes then call the ambulance.^{5,10-11}
- Major Cuts
- Apply a clean dressing and bandage
 - In case of a foreign body in the wound which cannot be removed easily, cover it with a dressing, and have sufficient pads around the wound without applying pressure to the foreign body.
 - In case no foreign body in the wound, but the cut is deep then have enough padding into the wound's depths.¹²
- Road side accident
- In case of wound, clean the wound by washing in running water. Remove splinters, thorns and pieces of glass inside the wound with a pair of tweezers to avoid infection.
 - In case of profuse bleeding, apply direct pressure on the wound by using any clean folded cloth.
 - In case of a Fracture, use a splint.
 - In case of abdomen injury, in abdominal wounds the intestines may come out. Cover the wound with a wet clean cloth and get the patient quickly to a hospital.
 - In case of chest injury, open chest wounds can suck the air which can make patient breathlessness. Cover the wound with a piece of polythene and putting a bandage on the top of it may help to reduce air being sucked into the chest. Get the patient quickly to hospital.
 - In case part of a limb is cut off, put it inside a clean polythene bag and place this bag in another bag with cold water. Put some ice in the water to keep it cool. Make sure that the limb does not get wet in water. If nothing is available then carry the amputated part in a clean cloth quickly to hospital.
 - In large crush injuries or in amputation, do not wash the wounds, as it can lead to more blood loss. Immediately, cover the wound with clean cloth and tie a pressure bandage quickly. If possible, keep the limb raised.
 - In case of an eye wound, Cover the eye with a clean soft cloth and place a stiff covering on top to prevent any pressure coming on the eye.
 - In case bleeding from nose, if the patient is conscious and can sit up, ask him to pinch his nose and breathe through his mouth and lean forward. If the patient is unconscious, he should lie with the face to one side, for the blood to come out easily, and there is no choking.
 - In case of Bleeding from ear, get the patient to lie down with the injured ear facing down
 - In case of Injuries to Muscles, Bones and Joints, apply cold water or ice packs wrapped in cloth if available. Putting a splint on the injured limb to make it less painful.
 - In case of broken bones and dislocated joints, splinting of injured part.¹³

Insect bite/ Spider bite	<ul style="list-style-type: none"> • If the insect's stinger is still embedded in the skin, remove it by gently scraping a flat-edged object, such as a credit card, across their skin. • Wash the affected area with soap and water. • Place ice pack or a cold compress on the area for about 10 minutes at a time to help reduce pain and swelling. • Apply calamine lotion to the area several times a day to help relieve itching and pain. • Prescribe them anti-histamines or rush to hospital if symptoms are severe.^{5,14}
Scorpion bite	<ul style="list-style-type: none"> • Clean the site of bite with soap and water. • Apply a cool compress to the affected area. This may help reduce pain. • Don't consume food or liquids in case of difficulty swallowing. • Prescribe NSAID for pain. • Rush to the hospital for assessment of severity of sting and possible complications.¹⁵
Snake bite	<ul style="list-style-type: none"> • Remove any ring, anklets, and bracelets from around the bitten part of the body as these can cause harm if swelling occurs. • Reassure the victim as majority of snake bites are caused by non-venomous snakes and risk of death is not immediate even after most venomous snake bites. • Splint the limb to keep the person completely immobilized. Call the ambulance or rush to the hospital. • Do not use a tight arterial tourniquet. • Applying pressure at the bite site with a pressure pad may be appropriate in some cases. • NSAID may be given for local pain. • Place the person on their left side in the recovery position as vomiting may occur. • Closely monitor airway and breathing and start CPR if needed.¹⁶⁻¹⁷
Dog bite	<ul style="list-style-type: none"> • Wash the site of bite with soap and water. • Softly press a clean cloth over the wound to stop the flow of blood. • Apply an antibacterial ointment to the wound. • Cover with a sterile bandage. • Rush to the hospital for assessment of dog bite severity, tetanus injection and treatment of possible infection.¹⁸⁻¹⁹

Suggestions to NMC/MOHFW

- To include handling of medical emergencies via telemedicine in their new training module for telemedicine.
- Creation of new feature on eSanjeevani portal for 24x7 medical emergencies.²⁰
- Asking medical colleges to develop a 24x7 telemedicine roster for doctors in emergency medicine department who can be available on eSanjeevani portal for handling distress calls for their particular region and after guiding the patient for first aid, can refer them to nearby medical emergency room.
- Integration of eSanjeevani portal with 108/102/1298 Ambulances.
- Allowing private players who have started different telemedicine platforms after MOHFW guideline issuance to create new features for medical emergency consultation and integration with 108/102/1298 Ambulances for providing end to end service to needy who are in trouble.
- eSanjeevani or other private telemedicine

platforms to integrate with suicidal prevention hotlines for providing suicidal prevention counselling to patients and immediate assistance.

A business case for a new start-up or for existing telemedicine platforms.

Government Regulation

- As per MOHFW guidelines, first aid advice, counselling and referral facilitation can be done to the patient⁴.

Services to be offered

Below are the services which can be provided

- An online 24X7 Emergency services feature to be incorporated as a separate feature in app or on website so the common people can notice it while visiting the app or website and can be used in emergency scenario.
- A 24X7 service can be provided by having minimum 3 different doctors in different shifts. More staffing will be needed to cover weekend coverage, leaves and holidays and

also depending on incoming call flow.

- Integration with 108/102/1298 Ambulances.
- Tie up with different private hospitals in different cities for emergency medical care of patients who will be brought to hospitals by 108/102/1298 Ambulance services.

Training & staffing

- All the doctors who are receiving calls from this feature should be trained in handling emergency scenarios.
- Doctor qualifications for this service- MBBS + at least 1-year experience of working in a casualty/Emergency medical services or MD/DNB in Emergency medicine.
- Private organizations or hospitals can create an in-house training module for training of doctors to handle distress calls.
- NMC is in process of developing online module for Telemedicine as a requisite qualification for telemedicine practice. If NMC includes medical emergency handling scenarios in its training modules then this will help to develop capability in current pool of doctors who are inclined to serve via telemedicine platforms.

Market size & unmet medical need

- In 2020, there were almost 700 million internet users across the country. This figure was anticipated to grow to over 974 million users by 2025; India was ranked as the second largest online market worldwide in 2019. The number of internet users was estimated to increase in both urban as well as rural regions.²¹
- In 2020, there were over 1.2 million doctors registered with the Indian Medical Council across the country. Now, India has more than 541 medical schools and it has achieved the capacity of an annual intake of 82,926 MBBS students at medical colleges regulated by the Medical Council of India.²²⁻²³
- As per WHO 2018 data, India is witnessing more than 2 million medical emergencies annually.³

Revenue model

- A premium price can be taken from all the subscribers who are availing this service.

Conclusion

India is witnessing a new type of change in its healthcare due to pandemic which has provided

opportunity to legalize telemedicine practice in India. This masterstroke move by MOHFW led to launch of many telemedicine platforms in Indian health care which has empowered rural population to seek specialty medical consultation via different modes of telecommunication. Health ministry's telemedicine service eSanjeevani recorded 1 million teleconsultations as on 14th of December 2020.

If private online consultations are included in this then this number may multiply multiple times as app-based doctor services have made medical consultation as an easy access to every house hold of country. With growing number of internet users, expanding emergency hospital facilities due to NMC requirement, increased focus on Emergency medicine in recent time, India can decrease the number of preventable deaths due to coronary heart disease, stroke, road traffic accidents, suicide, drowning and poisoning by providing app based integrated medical emergency services to its citizens.

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