Updates in **Emergency Medicine**

Review Article

Prehospital Emergency Services- Establishment and **Expansion of Sindh Emergency and Rescue Services-1021** In A Metropolitan City of Pakistan

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Introduction

Abstract:

Objective: This article describes the organization, expansion, and services provided by the Sindh Emergency and Rescue Services (SERS)-1021. Additionally, it will assist the government to take necessary actions in maintaining the quality of health services provided to the citizens of Pakistan.

Methods: We gathered the information through Google Scholar, PubMed, Scopus, and the official website of the organization. All the facts and figures were provided by the Data Department of SERS. All the references in the last ten years were given priority. The collection of filtered articles was refined by authors and only those in the English language were included. After excluding the unfit articles, the full papers were thoroughly read.

Results and Conclusion: The purpose of EMS is the assessment of emergency, care at site, care while on route to the healthcare facility, and care upon arrival at the healthcare facility. These types of prehospital services should be replicated in other parts of Pakistan as well. The system follows almost all the guidelines of the World health organization. It is suggested that the services of SERS should not only be limited to medical emergency services but also to overcome lackings in other rescue organizations. A centralized head office should be established at the city level to strengthen the coordination of various rescue services. Academic emergency medicine training of doctors and paramedics is also necessary.

Keywords: Prehospital care, Sindh emergency and rescue services, Primary health care

Introduction

An Emergency Medical Service (EMS) is defined as "an extensive system which has all the necessary facilities and equipment for the effective, and is coordinated and timely delivered to the victims" [1]. The aim of the EMS revolves around accessing emergency care, community healthcare, and

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prehospital care from the arrival at the incident location until the successful transfer of the victim to a healthcare facility [2]. In countries with a developed EMS system, providers are trained for emergency procedures ranging from administration of life-saving medication to placement of intravenous line and intubation [3,4].

Prehospital Care has always been an overlooked subject in the developing world including Pakistan. Injuries, intentional (violence) and unintentional, cause over five million deaths globally each year [5]. A lot of the deaths from these conditions occur during shifting to the hospitals, which demands the development of well-equipped prehospital care 6. In low-income countries like Pakistan, this is among the top ten contributors to disease burden and causes of disabilities, ending up increasing the burden falling on younger people in the population [5]. Building up standardized emergency services is a need of time throughout the world, especially in countries like Pakistan. Unfortunately, quite a few are working according to international standards. A few emergency services models were proposed and currently working in Pakistan [7].

The objective of this article is to represent the role of "Sindh emergency and rescue Services 1021" in providing principled pre-hospital care to the people of Sindh free of Cost. It will also provide assistance to governments in prioritizing their spending by identifying systems of care that maximize survival, reduce morbidity, and generate the basic surveillance and quality improvement data needed to support effective programs for injury prevention and control.

Methods

In this narrative review, we gathered the information through various sources including Google Scholar, PubMed, and Scopus, and the official website of the organization. All the facts and figures which we've mentioned in our article were provided by the Data Department of SERS. All the references in the last ten years were given priority. The collection of filtered articles was refined by authors and abstracts were read. Only those in the English language were included. Finally, after excluding the unfit articles, the full papers were accessed and thoroughly read.

PREHOSPITAL CARE- DEVELOPED VS. DEVELOPING COUNTRIES:

Various studies have been conducted in the past that suggested the lack of standardized prehospital care in the developing world [6,7]. Prehospital care in these parts of the world does not have a centralized system and is mostly been provided by bystanders, drivers, or volunteers [6]. On the contrary, a vast difference can be seen in facilities provided by the developed nations [8]. In most developed countries, the EMS has been working in co-operation with the other emergency services under one centralized head office. The police, firefighters, ambulance services, and Emergency physicians all are working below the wing of the head office [9].

EMERGENCY MEDICAL SERVICES IN PAKISTAN:

Pakistan, being deprived of resources, does not have a satisfactory healthcare infrastructure [2]. Like other third-world countries, emergency medical services have long been neglected in Pakistan [10,11]. Traditionally, patients were shifted to emergencies by relatives or bystanders in rudimentary patient transport vehicles mostly [12]. In 2006, Rescue 1122 was organized in Punjab, providing standard prehospital emergency services free of cost [13].

After two years in 2008, Sindh Emergency and Rescue services (SERS)-1021, formerly known as Sindh Rescue and medical services started providing its quality services in Karachi, a city that was already deprived of facilities [14].

Karachi, a metropolitan city of Pakistan, largest in terms of population unfortunately does not have a single centralized rescue service that could run the central command and control head office dealing with all the emergencies of Karachi [14].

SERS-1021 is a pre-hospital care service functioning in Karachi, Pakistan. This service initially started providing prehospital care and transfer of patients in fully equipped ambulances with trained Emergency medical technicians (EMTs) as a private ambulance service but very soon it collaborated with the Government of Sindh (GoS) to provide rescue services free of cost all across the city. The public can activate the EMS by dialing a toll-free number. SERS is a network of 60 ambulances along with five stations [15]. These are strategically assigned to respond to the call in its radius within 15 minutes.

SERVICES PROVIDED BY SINDH EMERGENCY AND RESCUE SERVICES-1021:

Certified Emergency Medical Technicians, Emergency Medical Dispatchers, and Paramedics: SERS-1021 has well-trained Dispatchers (EMDs) at the command-and-control center (C&C). They receive the incident information from the caller, assess the condition using the MPDS (Medical Priority Dispatch System) system which is a very sensitive tool for the assessment of the patient [16].

On-call Cardiopulmonary Resuscitation: SERS-1021 has USA-certified EMDs that instruct people on call for Cardiopulmonary Resuscitation (CPR) before the arrival of an ambulance. All the infield nurses get proper training for the handling of the patients along with specialized equipment as per international standards. They have availability of several equipments like airway, initial resuscitation tools like intravenous cannula, isotonic fluids, or 25% dextrose to prevent the pre-hospital mortality and morbidity. According to their recent data, they've served 1,351 patients per year on average. Studies have shown improvement in survival in outof-hospital cardiac arrest because of early CPR performed by bystanders and by untrained people under instruction provided over the telephone by the EMD before the EMS arrival. They don't prescribe adrenaline or any sort of cardiac drugs on call, however, adrenaline and other drugs are available in ambulances. Other than that they don't give antiarrhythmic drugs as well, but defibrillators are present in ambulances [17–20].

Advanced Pre-Hospital Trauma Care and Basic Life Support: In industrialized countries, trauma is the leading cause of death among the young [21]. Studies show a major ratio of deaths following trauma occurs before reaching hospitals [22]. Prehospital trauma care reduces trauma mortality, where scene to emergency room (ER) time is prolonged. Basic life support (BLS) measures by trained lay first helpers and paramedics are lifesaving. However, they don't intubate the patient since they don't have a laryngoscope. Although CPR is not included in the standard trauma care, it is performed if needed like if patient collapsed. On average, the number of out-of-hospital CPR done by SERS is 1,631 per year [23].

Safe Transport of Trauma Patients to Reduce Morbidity: Safe and quick transport to the hospital is made possible by SERS-1021 for the people of Karachi. Spinal cord injuries result in long-term disability, along with adverse effects on the quality of life of the affected individuals [24].

Fully Equipped Ambulance Services: SERS-1021 provides a quality transfer to the patients in fully-equipped ambulances having spinal boards, cervical collars, resuscitation stuff, crap bandages, immobilizers for limb fractures, airways, ambo bags, and emergency medications (like analgesics) kits with oxygen cylinders [25]. Recently in September

2020, they have made five portable ventilators available for the ambulances as well.

On-call Emergency Medical Officer-1025: For assessment of critical patients received by SERS ambulance, an on-call doctor is available at C&C head office to provide teleconsultation whenever needed [26]. This Increases the quality of care provided to the victim before arrival at the hospital. Also, EMS clinician makes decisions after on-call assessment of the patients who call from home; to stay at home at the moment with self-managed advice, to be transported to primary care for basic medical care, to be transported to the ER for critical care, or directly to a specialist for assessment or treatment within the hospital [25].

EXPANSION OF SINDH EMERGENCY AND RESCUE SERVICES:

Networking in Other Cities of Sindh: SERS-1021, which initially started as a private ambulance service in Karachi city, is currently expanded to other cities of Sindh, serving underprivileged areas of Sindh as well [15].

Partnerships with Other Organizations: SERS-1021 has developed a partnership with various organizations like the United States Agency for International Development, Bill and Melinda Foundation, and Edhi Foundation to utilize the resources in a better way for the people of Pakistan [27].

Role in the Coronavirus Disease-2019 Pandemic: SERS crew has fought from the front in a battle against the Coronavirus Disease-2019 (COVID-19) pandemic without compromising the facilities provided. SERS has received 30,0087 calls of patients (suspected and confirmed cases) from Karachi starting from February 2020 till February 2021. SERS-1021 assured the safety of EMTs, EMDs, and paramedics fighting in the frontline. They provide all the basic protective equipment to their warriors in this fight against COVID-19.

Coordination with The Government Hospitals/Intensive Care Units by Emergency Medical Officer-1025: SERS provides pre-arrival information of the critical patient to the concerned hospitals so that necessary arrangements have been made before the arrival of the patient. This decreases the delay in hospital care necessary for the patient.

Assessing and Facilitating Call from Home: Oncall Emergency Medical Officer (EMO)- 1025 has always been available at the C&C head office of SERS to receive calls from home and guide the patient either for home treatment, primary care setup, or tertiary care center. EMO also facilitated the arrangement of beds in coordination with the government and private hospitals especially for the COVID-19 patients in a situation when hospitals were overburdened. SERS in collaboration with GoS has provided COVID-19 Polymerase chain reaction (PCR) testing to the suspected individuals.

AmanTelehealth: SERSTelehealth is a 24/7 healthcare helpline that provides standardized, facile, and convenient access to diagnostic services, basic medical advice, and mental health counseling over the phone. It is also playing a vital role in the pandemic [28].

QUALITY ASSURANCE:

Active Command and Control system: SERS has a well-developed C&C providing its services 24/7 and responding promptly to all emergencies across the city. Well-trained EMDs assess the patients using MPDS [29].

Fleet tracking system: To provide an immediate response, SERS has a tracking system to track the location of every ambulance in their fleet. Whenever C&C gets a call for an emergency ambulance service, it can easily assign an ambulance that is nearest to

the emergency location. Thus, the time to respond to an emergency can be minimized.

Call surveillance system: Call surveillance is a process of data collection, analysis, and feedback. SERS has a Performance monitoring evaluation department for call surveillance of all the inbound and outbound calls. It helps to track the performance of EMDs. It allows the organization to identify the problems and rectify them to maintain the quality of care provided to the patients.

Appreciation/complaint calls received from patients: Appreciation and complaints play a crucial role to improve the standard of care. When patients/attendants are satisfied with the services they can make an appreciation call which will enter properly. In the same way, patients can report their complaints directly to the C&C which will be forwarded for further investigation. SERS is open to all complaints and gives a prompt response. All these steps help to improve the merit of care provided by SERS-1021.

CHALLENGES IN THE DEVELOPMENT OF CENTRALIZED RESCUE SERVICES:

Literature shows various hurdles in the development of successful centralized EMS development. The most common among them is inadequate funding (36%), others being lack of leadership (18%) and legislation setting standards within the system (18%) [6]. During the expansion of SERS-1021, the organization continues to face various challenges but always looked forward with the pure intention of serving the people of Pakistan.

FUTURE PLANS/PROPOSALS/STEPS THAT SHOULD BE TAKEN:

Development of Centralized Command and Control Center in a Metropolitan City: Karachi being the metropolitan city is always at the highest risk of trauma casualties, Road traffic accidents, and other emergencies. One centralized control Centre of International standards is a need of time. The prehospital and hospital services in Karachi are not adequate to manage a single emergency strike [30].

Number and Quality of Ambulances: SERS-1021 has 60 fully equipped ambulances with certified EMDs, EMTs, and paramedics. The city of Karachi with a population of 18 million, has no other standardized EMS to serve its people. Most of the patients are received in the ER by rudimentary patient transport. Increasing the number of quality ambulances (with BLS, ACLS, and portable ventilators) is a dire need of time.

Expanding the services throughout the province Sindh: Rural areas of Sindh are long being deprived of health facilities. SERS has a strong determination to expand its quality services all across the province.

Short Stay Mobile Trauma on High Ways/Motorways and other Hot Areas for Road traffic accidents: SERS-1021 received 2,935 RTA calls per year on average. Sadly, due to a lack of proper trauma facilities across the province, most of these patients receive trauma care after a considerable delay. The need for establishing short-stay trauma units to minimize the shifting time must be considered by the authorities.

Coordination with other Emergency Services: A small step is needed to establish a system to take all of these emergency services under one umbrella. Worldwide, EMS runs in coordination with other emergency services like rescue services, disaster response teams, animal rescue, fire services, crime control department, hospital ER units, and other community safety programs [12].

Need for Prehospital and Hospital Emergency Training: Prehospital, as well as hospital EMS, requires further development to tackle major disaster emergencies [30]. Training of EMDs, EMTs, EVOs, paramedics, and emergency clinicians according to the international standards is needful. Steps for First Aid Training Among Medical and Non-Medical Persons: Researches showing awareness regarding first aid among non-medical personnel is not satisfactory and even the medical ones are not up to the mark [31,32]. First aid training programs should be introduced at every level to reduce mortality and morbidity in emergency cases.

Conclusion:

The main purpose of EMS can easily be divided into four parts i.e. assessment of emergency, care at site, care while on route to the healthcare facility, and care upon arrival at the healthcare facility. SERS-1021 is providing outstanding services all across the city, meeting international standards. These types of prehospital services should be replicated in other parts of Pakistan as well. The system is following almost all the prehospital trauma system guidelines by the World health organization. Further, it is suggested that the services of SERS should not only be limited to medical emergency services but should further expand to overcome lackings in other rescue organizations. The involvement of the crime control department in providing emergency rescue services is also appreciated. The centralized head office should be established at the city level to strengthen the coordination of various rescue services which will enhance the standards of the facilities provided to the people. It is also necessary to increase the opportunities of academic emergency medicine training of doctors and paramedics to enhance the quality of care provided to the citizens.

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Conflict of interest:

The authors declare that there is no conflict of interest.

Author contribution:

PY, AMH, NH, and UY are responsible for the conception and design, interpretation, drafting, critical revision, and final approval of the manuscript.

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