

Dignified Management of the Dead from Humanitarian Forensic Odontology Perspective: A Need for the National and State Level Scientific Disaster Victim Identification Teams in India

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Abstract

Disasters are always unpredictable irrespective of their origin. The loss of human lives is a common outcome of disasters. Along with the physical and emotional trauma sustained by the victims, there is the additional responsibility of handling the deceased. Though there is an exclusive component with the management of the dead in place the specific issue about identifying them is still a complex process. Humanitarian forensics especially involves handling, identifying and disposing the dead bodies. It requires the application of the principles of forensic sciences in a multidisciplinary way. The role of forensic odontologists and anthropologists is not only restricted to the scientific collection of dental data from the dead body but also the proper utilization of the antemortem dental data to successfully establish the identity of the deceased, either alone or combined with secondary characteristics. Elaborate and comprehensive information with justification on the role of dental data and forensic odontologists in the dignified management of the dead need to be highlighted to the Disaster Management authorities. Several International organizations have pointed out the importance of odontology features in human identification. Moreover, forensic odontologists and general dentists are also involved in the international disaster victim identification teams. The present article provides basic knowledge on disaster risk management and the institutional framework in Disaster Management and also highlights the role of forensic odontology in disaster victim identification. It calls for national and state disaster victim identification teams with the involvement of forensic odontologists.

Keywords: Disaster Victim Identification, Dignified Management of the Dead, Humanitarian Forensic Odontology, Incident Response System, Sendai Framework

Introduction

Disaster Management involves the search for missing persons, the rescue of injured victims as well as the identification of the dead. This process requires the handling of human remains in a dignified way, right from

the moment of recovery of the body through the post-mortem data collection in a mortuary and until the body is returned to the family members of the deceased. The implementation of thorough identification procedures ensures that human remains are given back a name and an identity. It also contributes towards the respecting

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of medico-legal, ethical, socio-cultural, psycho-social, religious principles and humanitarian values¹⁻³. In mass disaster incidents, the identification process is carried out applying Interpol recommendations and international standards, which include the International Committee of the Red Cross (ICRC), International Federation of Red Cross and Red Crescent Societies (IFRC) recommendations. In India, the National Disaster Management Authority (NDMA) has framed the guidelines and protocols for the management of the dead in a dignified manner in the aftermath of a disaster⁴. The significance of dental data collection and dental autopsies in the Disaster Victim Identification (DVI) process has already been highlighted by numerous international and national standards and confirmed in several mass disasters, like the Tsunami in the South East Asian countries in 2004⁵⁻⁷. However, in the Indian context, the importance of forensic odontology in DVI needs to be strengthened by establishing standard guidelines and Standard Operating Procedures (SOPs). Also following the Interpol's DVI recommendations, the qualified forensic odontologists in India may be involved for the purpose of identification of the victims during disasters. This review article aims to offer a brief introduction to

disaster and disaster risk management and to highlight the importance of the dignified management of the dead in disaster from a forensic odontology perspective.

Disaster and Disaster Risk Management

Disaster is defined as “a catastrophe, mishap, calamity or grave occurrence in any area, arising from nature or man-made causes or by accident or negligence which result in substantial loss of life, of human suffering or damage to and destruction of property or damage to or degradation of environment and is of such nature or magnitude as to be beyond the coping capacity of the community of affected areas”⁸. The impacts of a disaster may include some deleterious effects on humankind and even loss of life⁹. According to World Health Organization (WHO) disaster is defined as a “sudden ecological phenomenon of sufficient magnitude to require external assistance”¹⁰. Disaster Management (DM) is defined as “the organization and management of available resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and

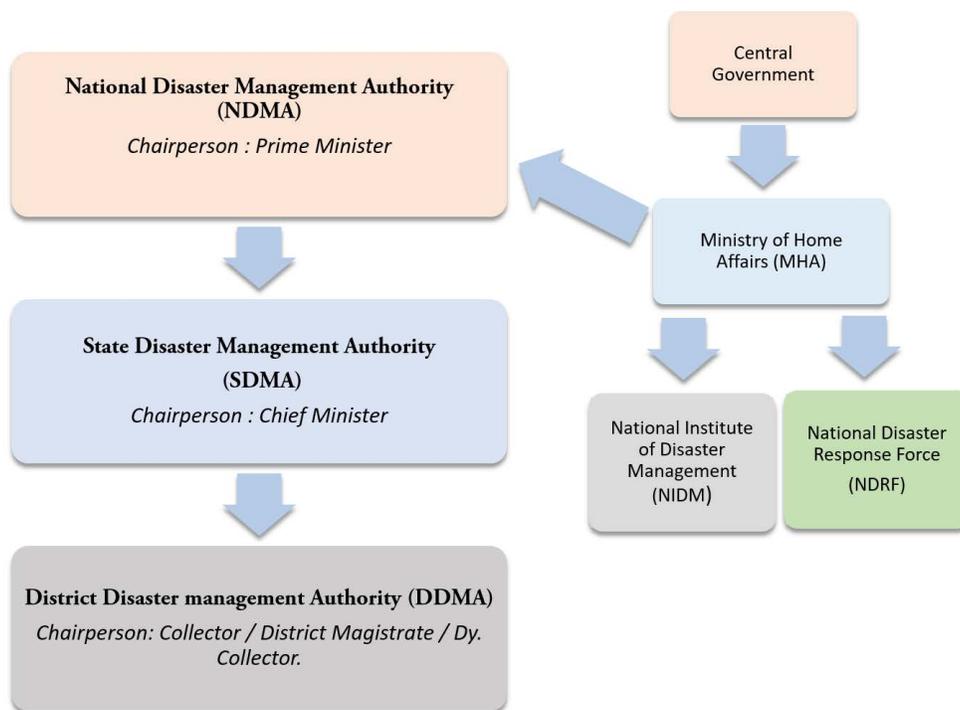


Figure 1: The hierarchical structure of the Disaster management system in India.

recovery in order to lessen the impact of the disaster on the community”¹¹. Disaster Risk Management is “the systematic process of using administrative directives and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.” Since 2002, the overall Disaster Management System of the country is under the aegis of the Ministry of Home Affairs (MHA), Govt. of India (GoI) (Figure 1). Earlier in 1990s, the Disaster Management cell was under the Ministry of Agriculture. The hierarchical structure for Disaster Management in India evolved after 2002¹². Following the enactment of the Disaster Management [DM] Act in 2005, the National Disaster Management Authority (NDMA) was formed^{8,13}. The National Disaster Management Plan (NDMP) was prepared by the NDMA in 2016⁹. This national action plan provides the overall directions and sets out the national goals for the various ministries and departments to develop their specific Disaster Management plans, including separate response plans and necessary SOPs. The responsibilities for Disaster Management lie with the state government and accordingly each state needs to set up the State Disaster Management Authority [SDMA]. According to the Sendai framework for disaster risk reduction, natural disasters fall into 5 categories namely, Geophysical, hydrological, meteorological, climatological, and biological¹¹. The man-made disaster situations may be the results of events such as terrorism, war, bioterrorism, riots or bomb blasts, etc. Nuclear and radiological accidents or incidents such as terrorist nuclear detonation or disasters at nuclear power plants may be categorized as radiological disasters¹⁴. The geo-climatic and the socio-economic conditions were responsible for several disasters that hit India in the past. The country has registered more than 400 disasters in the past thirty years resulting in loss of human lives and loss to property and other infrastructures.

Incident Response System (IRS) and Dead Body Management

The Disaster Management process involves three phases, namely, the pre-disaster phase, the disaster phase and the post-disaster phase. During the initial phase of Disaster Management, the Incident Response System (IRS) is established. Usually, the first responders to the disaster site are the local public and police officials, the state

disaster response team, firefighters and emergency health care workers. The priority of mass Disaster Management focuses on a preliminary assessment, the aim of which is to ensure the safety of the persons involved in the rescue and recovery operations along with the rescue of the survivors and the recovery of the human remains. Irrespective of the type of disaster, the management aspect of the bodies must ensure the deceased are handled properly and that a correct human identification process is followed. The possibility of multiple nationalities being among the victims should also be considered. The officer responsible for the incident response system may be the District Collector/District Magistrate/Dy. Collector. This officer appoints an Incident Commander (IC), who manages the disaster through incident response teams. There are three sections under the Incident commander: Operations Section (OS); Planning Section (PS); Logistic Section (LS). The team under the dead body management group in charge recovers the dead body from the disaster site and performs the identification process. The unclaimed and the unidentified bodies are kept in cold storage till the final disposal¹⁵. Under Section 34(g) of the DM Act 2005, the disaster authority makes necessary provisions for the disposal of the unclaimed bodies for general health issues. The responsibility for the disposal of unclaimed bodies lies with the District Magistrate or District Collector or Dy. Commissioner. The human resources required for the dignified management of the dead involves several teams of professionals, such as medical staff, forensic experts, psychologists, civil protection volunteers, along with unskilled workers from the community. Forensic fingerprint experts, forensic odontologists, forensic anthropologists, and DNA experts render their services towards the proper identification of the deceased. An inquest under CrPC 174 and 176 is required to ascertain the cause of sudden, suspicious, and unnatural deaths. However, in mass disaster situations, the legal obligation of carrying out the post-mortem can be waived after an inquest by the legal authority or by the Commissioner of Police.

Gujarat State Disaster Management Authority (GSDMA)

The GSDMA was constituted by the Government of Gujarat on 8th February 2001, immediately following the devastating earthquake of 26th January 2001¹⁶. The Disaster Management policy for the state of Gujarat was declared

in the year 2002 and the following year the “Gujarat State Disaster Management Act, was passed, which came into force from 13th May 2003¹⁷. Thus Gujarat became the first state in India to introduce an Act to provide a legal and regulatory framework for Disaster Management¹⁸. Section 7 of the GSDMA Act provides the constitution of the authority and the Chief Minister of the state, ex-officio is the Chairperson of the Authority. The Central Government enacted the Disaster Management Act in 2005 and formed the National Disaster Management Authority (NDMA), which is the apex body for Disaster Management in India¹⁹.

Gujarat Institute of Disaster Management (GIDM)

The Gujarat Institute of Disaster Management (GIDM) is an autonomous body established by Government of Gujarat on 26th January, 2004²⁰. The Institute has been entrusted with the responsibility of human resources development, capacity building, training and research and documentation in the field of Disaster Risk Management (DRM). Since the introduction of the ‘Sendai Framework for Disaster Risk Reduction (SFDRR 2015-30)’, there has been a paradigm shift from ‘Managing Disasters’ to ‘Disaster Risk Management’. Along with this, the ‘2030 Agenda for Sustainable Development Goals (SDGs) is steering our world towards sustainable development as an overarching agreement amongst all nations. GIDM, through its capacity-building programs, is fostering the concerted ideology of Risk-Informed Planning and Disaster Resilient Sustainable Development²¹. A Program Development and Research (PDR) committee with experts from forensic science, forensic medicine, forensic odontology and biotechnology was constituted under GIDM to draft the guidelines and SOPs on the dignified management of the dead.

International Centre for Humanitarian Forensics (ICHF)

ICHF was established by the National Forensic Sciences University (formerly, Gujarat Forensic Sciences University) with the collaboration of the International Committee of the Red Cross (ICRC)^{22,23}. It is the first of its kind worldwide and is based at Gandhinagar in Gujarat. As an established Government-run university there is

an added advantage of imparting academia, research and training and consultancy services under a single umbrella. All concepts and comprehensive protocols followed are within the strict guidelines promulgated by the international police organization, Interpol. The ICHF is a comprehensive center of forensic services that occupies itself with the concerns of those members of society unfortunate enough to be involved in unforeseen disasters of any kind, manmade or of natural origins, sudden outbreaks of infectious diseases with a heavy toll on human lives, victims of conflicts involving race, religion, region, ethnicity and ideology, etc. One of the most important components of the academic center is an academic program that involves humanitarian forensics with an emphasis on the humanitarian aspects of victim management in a disaster or a crisis. The curriculum involves advanced concepts on the need for the identification of victims with scientific concepts, psychological support for the victims, medico-social, medico-legal and socio-cultural aspects of the victims, digital methods of handling data for the timely and effective identification of the victims. In addition to this, advances in the management of the dead are also achieved. The steering techniques and concepts are also imparted in the curriculum with mandated and feasible technical approaches. There is also a practical approach that is being imparted to the students for their enhanced competency. This involves the mandatory scientific identification parameters such as fingerprints, DNA, odontology, anthropology and socio-cultural anthropology, clinical and forensic psychology and other disciplines. The victims of abuse such as those against women, children and the elderly will be also offered the services which come under the category of humanitarian forensic action. The humanitarian forensic action involves psychosocial support, psychological and emotional support, primary health care and social and psychological normalcy. This center is hoping to serve as a global center in its true sense with egalitarianism.

Disaster Victim Identification (DVI)

Establishing the identity of the deceased victims is an integral part of the disaster response management system. The dead bodies are recovered and the identification process is carried out scientifically in a respectful

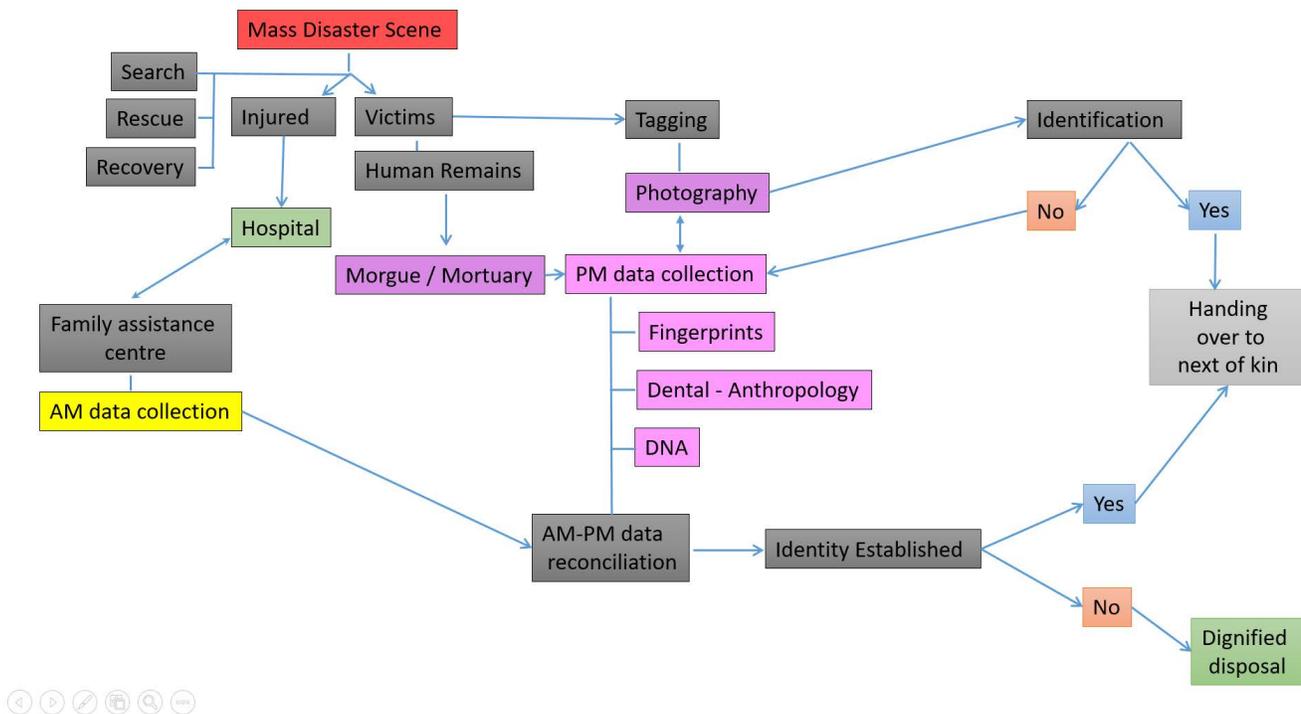


Figure 2: The process of disaster victim identification for the dignified management of the dead.

manner²⁴. In mass disaster situations, the human rights of the affected persons must be taken into account as well as following a humanitarian approach in dealing with the dead²⁵. The identification of the body leads to the successful handing over to the next of kin and also addresses the legal, political, ethical, cultural, psychosocial and even criminal aspects. The four general principles of Lord Justice Clarke that are applied during the dead body identification²⁶, they are the provision of honest and as far as possible, accurate information at all times and every stage; respect for the deceased and the bereaved; sympathetic and caring approach throughout; and the avoidance of mistaken identification²⁷⁻²⁹. Clarke's report also recommends that the methods used for identification should be clear and the use of invasive procedures such as the removal of body parts that may ultimately lead to disfigurement should be avoided unless necessary. This also emphasizes the need for the homogenous and extensive training of those involved in the identification process. In addition, there is a need to establish guidance and methodology for identification, including up-to-date technology and contemporary knowledge on the advances in the methodology of forensic techniques³⁰. When identifying the dead in mass disaster situations, both

circumstantial and physical evidence must be considered. The circumstantial evidence and secondary identifiers are part of the investigation and can support the identification process. These include the following findings: personal belongings, tattoos, clothing and jewelry. An absolute identification can be achieved through the primary biological sources such as, fingerprints, dental records and DNA which can be collected without invasive procedures being used⁵. A manual for disaster victim identification was first released by the International Police Organization (Interpol) in 1984^{5,31}. This manual was updated periodically and the current version is available since 2018. It is a web resource that can be downloaded from the Interpol website. Other organizations such as the Pan American Health Organization (PAHO), the International Committee of the Red Cross (ICRC), the World Health Organization (WHO) and the International Federation of Red Cross and Red Crescent Societies (IFRC) jointly published guidelines for the management of dead bodies after disasters³²⁻³⁴. The dead body management in mass disasters includes those humanitarian actions where the dignity of the deceased is protected and their identity is properly established³⁵. Age estimation and sex determination through biological means can also play

an integral role in expediting the identification process. This humanitarian and professional forensic approach in DVI will also improve the morale of the personnel involved and minimize the mental distress and trauma of the relatives of the deceased³⁶. Every country needs to improve forensic skills in the humanitarian field³⁵. In India, this calls for the incorporation of DVI teams on a national as well as state level, involving qualified forensic experts, including forensic odontologists.

Forensic Odontology and the Dignified Management of the Dead

Forensic odontology is a speciality of dentistry and forensic sciences which involves recognizing, collecting, examining, recording, analyzing and evaluating dental evidence, from a crime scene, disaster or terrorist site. The main purpose of forensic odontology through the examination of jaws, teeth and dental treatments and other features of unknown human remains has the aim of arriving at a biological profile and performing a comparison of dental data to achieve an identification³⁷. Identification is one of the prime requisites during the management of the dead (Figure 2). Dental identification is the timeliest and economical process, as dental structures and treatments often remain the only structures that provide valuable information when human remains are decomposed or carbonized. This underlines the importance of involving odontological experts in forensic odontology and DVI in all phases of disaster victim identification³⁸. Dental structures are often dislodged during the perimortem and/or post-mortem stage and sometimes may be completely overlooked by untrained or non-dental personnel. Hence, the importance of forensic odontologists being involved during the initial search and recovery phase of DVI³⁸. The failure to collect all the PM dental evidence may create a lacuna in the PM dental data and may complicate or delay the identification process, even when sufficient AM dental data are made available. The forensic odontologist will stabilize the dental structures with spray adhesive and secure the head region with a plastic protective wrap during the recovery phase before transporting the body to the mortuary³⁹. This will ensure the preservation of the dental evidence and prevent further damage or loss of dental structures before the dental profiling at the mortuary. Furthermore,

the most important role of a forensic dentist is to establish the identity of the victim using the available AM and PM dental records^{38,40}. When a sufficient amount of AM and PM dental data are available, they are compared both manually and electronically using the dedicated software programs²⁵. Thus for a successful identification, good quality and accurate antemortem dental records are required along with good quality post-mortem dental findings⁴¹. It was reported that 60% to 70% of the disaster victims could be identified entirely or partly through dental findings⁴². In forensic odontology, several biologic parameters are considered while comparing the AM and PM data. The dental case sheets, the dentition status, restorations, dentures, radiographs and intra-oral photographs, as well as soft tissue parameters like lip prints, rugae patterns, dental anthropological assessments and analysis of DNA from teeth^{43,44}.

The use of dental implant details and the incorporation of identification labels like the Radio Frequency Identification (RFID) tag in dentures also may aid the identification²⁵. Reports reveal that the success rate of identifying a missing person is significantly higher when the person's dental records are available for comparisons⁴⁵. During the Indian Ocean Tsunami in Thailand, dental records played a major role as the primary identifier in identifying 46.2% of the cases⁴⁵. The forensic odontology investigation was the leading method of identification of victims from the Thai Tsunami victim identification process in Phuket⁴⁶. A recent systematic review of 20 major disasters involving a total of more than 23,000 victims, revealed that forensic odontology was involved in 17 disaster scenarios⁴⁷. Overall, nearly 80% of the victims were identified using odontological means⁴⁸⁻⁵². In cases where the bodies were charred beyond identification, 61% of the victims were identified by dental data. Even in the absence of dental records, a complete dental autopsy could provide a generic biological profile of the deceased which may narrow the search of missing persons. The PM dental profiling may give some information about the habits, diet or occupation of a victim through a physical and radiographic examination of the teeth and paradental structures using Computer Tomography (CT) scanning and three-dimensional (3D) virtual modelling^{53,54}. Therefore, with so much evidence and data, forensic odontology may justly be considered a reliable method in all human identification processes. Forensic odontologists need to work in close association with the police, judicial administrators, government agencies,

forensic pathologists and general dentists during the DVI process. On humanitarian grounds, the involvement of forensic odontologists is not only restricted to the scientific collection of PM dental data but also the proper utilization of the AM dental data to successfully establish the identity of the deceased, either alone or combined with secondary identifiers. If identification of the victim is established, the body is handed over to the next-of-kin for dignified disposal according to the respective religious and social protocols. Even unidentified bodies need to be disposed off in a dignified manner⁵⁵. The temporary storage of such bodies is facilitated through the Controlled Temporary Burial (TCB) method, in such a way that the body may be easily exhumed whenever claimed by the next of kin⁵⁶. The role of forensic odontology in DVI in an Indian context has already been brought into focus by two Indian forensic odontologists previously^{57,58}. With the available qualified forensic odontologists in several states, the state Disaster Management authorities may involve their expertise service in victim identification at times of need. Moreover, there is a need for a standard and uniform dental record maintenance system, which should be made mandatory at both the private and government dental setups. All the stakeholders in the Disaster Management system also need to be sensitized about the use of biological data, especially the dental data in the identification process.

Conclusion

The Disaster Management system in India and human identification process require incorporation of the Interpol recommendations, the establishment of Standard Operating Procedures (SOPs) and proper Disaster Victim Identification (DVI) teams with trained and qualified forensic odontologists. As a member country of Interpol and considering the ethical aspects of giving an identity to unidentified human remains, Indian relevant authorities can upgrade the best practice in human identification, for both single and multiple fatalities, through the involvement of forensic odontology experts in DVI procedures.

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