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PREPAREDNESS FOR MEDICAL REHABILITATION OF CASUALTIES IN DISASTER SITUATIONS

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SUMMARY

Natural and man-made disasters produce large numbers of severely and multiply injured casualties, many of whom survive with severe impairments that require comprehensive and protracted rehabilitation (brain and spinal cord damage, peripheral nerve injuries, amputations).

In a disaster situation, even adequately developed rehabilitation services are unable to provide care to the large number of casualties, without advance planning and preparation.

Such planning has to consider expansion of available rehabilitation institutions and conversion of other facilities into settings for rehabilitation, and integrating all into a rehabilitation referral system consisting of levels of care. It should further consider strengthening community service for the provision of continuity of rehabilitation care and the preparation of guidelines for adequate management of various categories of disablements at various levels.

The paper offers guidance to those in disaster prone areas, or in anticipation of a disaster, who might wish to undertake the planning, as well as to those who need to organise available services or to set up new ones, once the disaster has occurred.

Key-words : disaster situations - rehabilitation of casualties - preparedness for rehabilitation - guidelines for rehabilitation.

INTRODUCTION

From the health point of view, disasters are destructive events that cause many casualties within a short period of time[1]. They often place a significant overload on existing medical facilities and may cause structural damage which seriously reduces their potential and makes them inoperational[2].

Disasters may be due to natural causes (earthquakes, floods, tornadoes, tsunami waves, hurricanes, cyclones, volcanic eruptions, meteoric collisions, avalanches) or to man-made causes (traffic accidents, explosions, technological accidents,collapse of buildings or bridges, civil disturbances, acts of terrorism, armed conflicts, wars).

Advance planning may ensure that effective services are available, when needed; it is based on the awareness of ways in which the disaster may affect health and on the anticipation of tasks to be performed, and entails the allotment of resources to carry out these tasks[3].

In most respects each disaster is unique, depending on its type, magnitude and time of occurrence and on the physical and demographic variables of the geographic area in which it occurs However, health problems that are caused in a stated area by a specific type of disaster, may be qualitatively predicted with casualties sustaining injuries that are in their type, severity and bodily distribution largely characteristic for specific disaster types. Therefore, health planning and preparedness for disaster situations is feasible.

Most planning has focused on immediate needs: rescue and evacuation of casualties, first aid, initial and definitive surgery. As improvements in emergency systems have increased the survival of severe and multiple trauma casualties, many survivors remain with impairments that require rehabilitation: brain and spinal cord damage, severe trauma to limbs (with amputations and peripheral nerve injuries), severe and extensive burns, loss of sight or hearing.

As regards man-made disasters, among the 20 000 people affected by ingestion of toxic oil in Spain in 1981, many developed paresis of limbs and atrophy of muscles[4]. Terrorist bombing incidents affect mainly extremities, abdomen and thorax, but the most common injury in the fatally wounded is brain damage[5] The Christmas turmoil in Bucharest,

Romania in 1990 resulted in many casualties among them spinal cord injured[6]. The civil war in Tajikistan (1992-93) left 127 amputees, 29 spinal cord injuries, 10 brain damaged and 27 casualties with peripheral nerve damage[7]. The 1991 to 1994 war in Croatia left more than 25.000 wounded in need of rehabilitation, among them 767 with amputations, 396 with brain damage, 122 with spinal cord injury and 658 with peripheral nerve injuries[8]. It is estimated that the war in Bosnia and Herzegowina resulted in more than 40.000 wounded requiring rehabilitation, among them 4000 with amputations, 1200 with brain damage, 750 with spinal cord injuries and 3000 with damaged peripheral nerves[9].

Some disasters due to natural causes also result in many casualties in need of rehabilitation. Cyclones cause large numbers of skeletal and vertebral fractures (with damage to the cord) and blunt trauma to the head[10]. Tornadoes cause multiple injuries, with the most common site being the head (with extensive brain damage) and the limbs[11-13] In earthquakes, the most frequently traumatized area are lower extremities with severe, compound fractures and soft tissue injuries (sometimes with extensive damage to nerves); head injuries are frequent and in 20% of these there is intracranial pathology, while vertebral fractures are also not uncommon, and in 15% to 34% there is damage to the spinal cord[2,14-18].

Psychological reactions accompanying physical disablements may be particularly severe in disaster situations, since they are often compounded by disintegration of family, destruction of home, bereavement[17], and in the case of war by additional psychological trauma, such as rape, loss of freedom and torture Psychological difficulties require special, psychosocial attention[4] and may impede the process of physical rehabilitation; their neglect may have severe, long-term consequences.

It is obvious then, that planning of rehabilitation services for disaster casualties has to be considered; without advance planning and preparedness, even adequately developed services are unable to cope with the large number of casualties in need of rehabilitation in a disaster situation. The main issues to be addressed are.

* Preparedness of rehabilitation institutions
* Continuity of care in the community
* Guidelines for rehabilitation management

PREPAREDNESS OF REHABILITATION INSTITUTIONS

A proposal for the planning and preparation of rehabilitation institutions has been published elsewhere[19] Briefly, it suggests a mapping of rehabilitation institutions in the country (or region in a large one), a study of their resources and rehabilitation potential and the possibility and ways for their enlargement and strengthening to enable the management of a larger number of casualties. Next, a mapping and study of facilities that have some rehabilitation potential - such as geriatric institutions, handicapped children's homes, departments or hospitals for rheumatic diseases, balneoclimatological sanatoria or spas, outpatient clinics for psysiatry - in order to determine whether these (or part of them) could be converted into facilities for the rehabilitation of disaster casualties.

Assuming that rehabilitation needs in disasters exceed the potential of existing rehabilitation institutions (even after their expansion and strengthening), the proposal further suggests establishing three levels of rehabilitation in order to ensure that only those of the injured in need of specialized activities are referred to well-developed institutions and the remaining rehabilitated at other stations along the referral system Accordingly,

Level A would consist of simple rehabilitation activities provided in the acute care hospital in which casualties obtain their surgical treatment, until discharged or transferred to a Level B or C facility

Level B would consist of general rehabilitation activities provided in existing institutions for general rehabilitation, or in facilities converted for this purpose, it would include casualties who have sustained severe, complicated injuries to their locomotor system, are not independent and are in need of active, inpatient rehabilitation to reduce their dependency (i.e. mainly nursing, physical and occupational therapy).

Level C would consist of specific rehabilitation activities provided to casualties who are dependent and in need of comprehensive, multidisciplinary care - nursing, physio-therapy, occupational and speech therapy, neuropsychological assessment and care, prosthetic and engineering services. This level of care would be provided only in existing rehabilitation institution which in non-disaster situations focus on patients with brain and spinal cord

damage and amputations, or in institutions set up or converted for this purpose. Severe burns and peripheral nerve injuries would best be rehabilitated in specialized centres possessing the necessary surgical expertise and resources.

Thus, the proposal recommends the establishment of a rehabilitation referral system and suggests a policy for casualty flow through it. It also addresses the planning of resources for facilities at various levels. The proposed planning and preparation could be adapted and implemented in most countries in which elements of the suggested system exist.

Almost all countries have facilities for prosthetic rehabilitation of persons with amputations Specialized units for patients with spinal cord damage exist in almost all developed countries, even in remote areas[20], and in some less developed ones[6,21-23]. However, units for rehabilitation of traumatic brain injury have been slower to develop, except in the USA, Israel and Australia[24,25], although the need for such specialized and categorical services has been generally accepted[26] Proposals for the design, organization and functioning of such units are available[27,28].

In countries without some elements of the proposed system, the urgent need for specialized units becomes apparent during disaster situations A general ward is then converted into such a unit with professionals recruited by international organizations[6,17]. During the recent war in Croatia, rehabilitation of limb fractures, peripheral nerve injuries and burns was provided adequately in acute, general hospitals, and casualties with amputations received good care at the available National Referral Centre, however, there were no specialized facilities for the rehabilitation of brain and cord injury. Within one of the rheumatological hospitals cum spa, a nucleus for spinal cord damage existed, and this was strengthened and made into the referral centre for such damage; in another, similar hospital, a unit for rehabilitation of stroke was strengthened to become the referral centre for brain injuries. Other spas and some outpatient departments for physiatry were converted into Level B facilities[29]

These hastily established units, and the converted ones, may become the nucleus for a permanent setting for the rehabilitation of patients sustaining non-disaster related conditions, and have the ability to expand their services in the event of another disaster situation.

CONTINUITY OF CARE IN THE COMMUNITY

Early rehabilitation needs of persons with physical trauma will be met by the described system of rehabilitation facilities.

On completion of inpatient rehabilitation, casualties are discharged home, often with remaining disablements, sometimes earlier than is usual in non-disaster situations (in order to admit more patients) Serious social problems (destruction of home, dispersal or death of family) as well as the need to provide specially adapted housing, may delay the discharge; this leads to blocking of rehabilitation beds and, if prolonged, unfavourably affects psychosocial rehabilitation and integration into society. It is useful to find temporary accomodation (holding centres, active reconvalescent houses, foster families) until the person may return home.

Discharged individuals with disablements are in need of continuity of care aimed at maintenance of functional status achieved as inpatients and at optimization of abilities to enable reintegration into family, community and society. Thus, rehabilitation in the community has to address physical and psychological, as well as occupational and social needs of individuals with disablements. However, existing resources in the community may be inadequate and may need strengthening The following issues have to be addressed·

*Facilities for physical rehabilitation may be lacking or insufficient. Depending on local resources, village hospitals may be converted for this purpose[30], as well as clinics, primary care centres, and schools. Minor building adaptations may be necessary, water and heat have to be supplied Collaboration with local community leaders is essential for the successful mobilization of resources.

*Equipment needed is simple· rehabilitation in the community aims at developing independence and focuses on exercises amd functional activities. Low technology equipment (weights, pulleys) and common household objects are useful for this purpose Battery operated stimulators, hot and cold packs may also be available and used, and splinting material would be useful.

*Primary care teams may provide rehabilitation care[31]. However, these teams may not be experienced in the management of severe disability and its psychological impact Training

programmes should be arranged, on site, with the help of visiting experts and group seminars, possibly combined with short visits to regional rehabilitation centres. Use should be made of local professional expertise as well as of assistance from international, non-governmental organizations. The latter are usually very active in disaster situations and should work within the framework of the local administration and in close collaboration with it, to facilitate coordination of services and efficient use of expertise and resources.

*Rehabilitation professionals may be lacking in the community; they can be relocated from rehabilitation institutions from other regions or recruited from retired personnel. Nurses and health technicians (or assistants) may be trained in basic techniques of physical and occupational therapy. Volunteers may be motivated and effectively trained as community rehabilitation workers[32,33].

*Physical aids for living may be made inexpensively from local materials in the community; they include wheel chairs, walking aids, seating adaptations, grab bars, aids for manual skills, self-care and communication

*Adaptations to buildings (homes, schools, work places), such as ramps, widening of doors and others, may be needed to improve their accessibility for persons with disability; some individuals may have to be relocated to ground floor living.

*Family and patient education is an important part of the continuity of care in the community; family members and other carers can be trained in simple rehabilitation technique, to be performed at home. Persons with disability should be taught techniques of self-rehabilitation and, together with family and community,be given the responsibility for rehabilitation[34].

*Re-training and vocational rehabilitation efforts have to be undertaken, to enable the person with the disability to return to work; for each individual a work-place should be found in which he or she can function according to inherent potential matched with ability, and the ability has to be developed.

*Follow-up at the institution at which the person with the disability was treated as inpatient should be organized six months after discharge and annually thereafter.

GUIDELINES FOR REHABILITATION MANAGEMENT

The need for expansion and strengthening of rehabilitation institutions and for the conversion of facilities entails deployment of health professionals with no or insufficient competence in the care of severe disabilities, rehabilitation specialists will have to train them

on the job and coordinate and supervise their activities. Primary care teams will have to continue the long-term management of persons with disabilities in the community, often without having the necessary training and experience for this task

Policy and goals of rehabilitation in this newly established rehabilitation system should pervade all its elements. All those working in it should be aware of the tasks expected of the system and its components, and of the appropriate way to perform these tasks.

In order to facilitate the attainment of this common purpose, it is essential to prepare guidelines, i.e. systematically developed statements to assist practitioner and patient decisions about the appropriate care for specific clinical circumstances[35].

Guidelines are needed on how best to rehabilitate wounded at various levels of the system; they should outline the adequate management of various categories of disablements, highlighting the practical steps and procedures , and serve as a systematic reminder for step-by-step performance. Such guidelines address categories of casualties as a group and may not be appropriate for a given individual; they cannot address every problem or nuance of circumstances as they apply to specific persons, family and community.

Following the wars in Tajikistan and in Yougoslavia, the European Regional Office of the World Health Organization (WHO) initiated the preparation of such guidelines, intending to publish them as a WHO position paper, to be distributed to all Member States. These guidelines have been reviewed and finalized by an international group of experts[36]. They need to be adapted and modified according to relevant conditions in various countries, or even redrawn locally, to increase the sense of ownership and committment to the guidance and advice they contain[37].

CONCLUSIONS AND RECOMMENDATIONS

Natural or man-made disasters may generate, within a short period of time, large numbers of severe casualties who survive with impairments requiring medical rehabilitation

Available rehabilitation services may be unable to cope with the situation without advance planning and preparation.

Countries prone to natural or technological disasters or anticipating civil disturbances or armed conflicts, should plan and prepare their rehabilitation services in advance. Once the disaster has occurred, it is possible to assess the number of casualties who will be in need of rehabilitation, according to types, and to prepare the required services accordingly.

It is hoped that the suggestions offered in this paper may be useful to those who will engage in the planning and preparation of rehabilitation services for casualties of disasters.

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