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The Role of Oral Health in Complex Emergencies and Disaster Rehabilitation Medicine.

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Abstract

This paper presents an overview of the importance of oral health in complex emergencies. It highlights the importance of maintaining general and oral health in the acute, intermediate and long-term phases of such events which are increasing in frequency. The importance of oral health as an early warning sign for systemic disease and deprivation is also explored along with the crucial role of oral health in maintaining quality of life through adequate nutrition and speech.

The overview of oral health in these situations identifies the need for training dental personnel as members of rehabilitation teams that set out to manage these disasters. They can quickly help in improving quality of life for victims by extracting carious and painful teeth as necessary and also form part of an oral health education programme for aid agencies. They can also be the first to identify systemic diseases like HIV and may also play a role in identifying victims of abuse as non-accidental injuries can frequently present in the oro-facial region.

The oral health overview concludes by describing the contents of innovative oral health packs that are tailored towards prevention of dental diseases and that can be readily incorporated as part of food packs distributed by aid agencies.

Introduction

There has been a steady increase in both the number and severity of natural disasters and conflicts globally which has led to almost doubling of the number of displaced persons over the past 20 years[1]. Agencies are increasingly dealing with situations better described as complex emergencies and are defined as 'relatively acute situations affecting large civilian populations, usually involving a combination of war or civil strife, food shortages, and population displacement, resulting in significant excess mortality'[2]. As a result the WHO has established a sub-committee on Rehabilitation disaster relief [3] that aims to enhance the response to rehabilitation in these frequently occurring large scale disasters and complex emergencies. This has seen the emergence of disaster rehabilitation as an important subspecialty in physical and rehabilitation medicine[3].

Whilst the focus in the past has been on the immediate emergency phase, it is now evident that the increased severity of such situations is resulting in crippling of pre-disaster health and rehabilitation services[4]. This challenges international rehabilitation services even more as they not only have to cope with the immediate emergency, but they also have to plan for medium and longer term care for the victims[4]. Victims of complex emergencies are left extremely vulnerable due to a sudden change in underlying social, political, economic and physical infrastructures. Needless to say international agencies need to re-establish many of these infrastructures rapidly to reduce dependence of affected population given that the victims of modern day complex emergencies are largely civilians. A large part of this task of rehabilitation therefore needs to focus on improving quality of life and access to basic essentials like food, water shelter and security.

The oral cavity plays a crucial role in the overall well being of a person and its damage thereof can cause considerable suffering by affecting basic and essential functions like eating and speaking. Severe caries leads to pain, discomfort, disfigurement, acute and chronic infections, and eating and sleeping disruption as well as higher risk of hospitalisation, high treatment costs and lost work / school days [5]. For children, caries affects nutrition, growth and weight gain leading to, for example, lower levels of beta carotene, folate and vitamin C [5]. The failure to incorporate oral health into general health promotion and management can lead to thousands suffering intractable toothache and poor quality of life [5]. Furthermore the symptoms of a large number of systemic diseases manifest initially in the oral cavity which can be a crucial early warning system for the development of these diseases. In the context of disasters and conflicts this would include anaemia which needs early detection to avoid malnutrition. Oral diseases also share common risk factors with a number of chronic diseases: obesity, smoking, alcohol, risky behaviours causing injuries, and stress [5].

Indeed the Pan American Health Organisation (PAHO) has developed post-disaster guidelines for oral health[6] which serve as a framework for achieving the overarching goal of rebuilding and integrating oral health with primary health care services. These guidelines highlight how oral health has been overlooked in the past and their purpose is to provide technical assistance to humanitarian stakeholders in rebuilding oral health through a needs assessment[6]. In particular, the guidelines identify that vulnerable groups during the post-disaster period are likely to bear the greatest burden of oral disease and the substantial associated treatment cost. Therefore the prevalence of oral diseases among vulnerable groups such as women, children, the elderly,

persons with disabilities, and geographically or socially isolated persons should be accounted for [6].

The aims of this paper were therefore to highlight the oral health needs of such vulnerable groups within the context of complex emergencies and thereby focus on the importance of oral health on quality of life and as an indicator of systemic disease.

Specific objectives:

1. To investigate the role of oral health in the acute phase of a complex emergency
2. To investigate the role of oral health in the medium to long term rehabilitation phase
3. To provide evidence informed oral health packs which can be incorporated into the armamentarium of international agencies when they provide relief in complex emergencies.

Method – Conceptual Scenario

This paper will use a conceptual scenario to address the aims and objectives. The scenario depicts a family involved in a complex emergency. It comprises of a 50 year old man, his 45 year old wife, 3 children (daughter aged 4yrs, sons aged 2yrs and 4 weeks) and his frail, elderly father. They have a high pre-disaster vulnerability as the majority are dependents whose capacity to anticipate, cope with, resist and recover from the sequelae of the complex emergency is poor. The scenario focuses on vulnerable groups as during the post-disaster period vulnerable groups are likely to bear the greatest burden of oral disease and the substantial associated treatment cost.[6]

Acute phase

The family is likely to stay at home if it is not affected by the emergency. This is the best option provided the emergency is under control (crude mortality <1/10,000 per day (< 2/10,000 for under 5yr old) or <15% of under 5's below 80% weight and height and absence of epidemics of measles, acute respiratory infections and/or malaria) [7]. It will give them psychological comfort through a sense of self-esteem and independence and would be important for the elderly member who will find it hard to adjust to changing environments[7,8].

General health needs

Health is 'a state of complete physical, mental and social well-being and not merely the absence of disease' [7] and therefore encompasses the needs to sustain both the lives and livelihood of the family as follows:

1. Nutrition – energy requirements for a low-middle income country are 2100 kcal; 46g of protein and micronutrients (Vitamin A, thiamine, riboflavin, Vitamin C, iron, iodine and folic acid) [7,8]. The lactating mother will need additional energy and iron supplements may have to be considered for the newborn[7,8].
2. Water - 20 litres/person/day of clean, preferably chlorinated water [7,8].
3. Shelter – $4m^2$ of space per person including protection from adverse weather and fire [7,8].
4. Sanitation – 1 latrine per family [7,8].
5. Hygiene – nappies for the baby, soap and water for washing [7,9].
6. Healthcare services – immunizations for children particularly measles, meningococcal meningitis and other standard vaccinations which are given in

these age groups (DPT, BCG) [7,8,9]. The spouse will need support (midwife) to continue breastfeeding and monitor weight of newborn.

7. General security - personal security and security of belongings.
8. Communications – General infrastructure (roads), radio, television, internet to monitor progress of emergency.
9. Fuel for cooking, heating etc – 15kg/household/day reduced to 5kg if a stove is available [7,8,9].
10. Non-food items – clothing, blankets, bedding, cooking utensils [7,8].

Oral Health needs in the acute phase:

An investigation from a 3 year retrospective record review of oral and dental health needs in an international humanitarian mission[10] showed that the majority of presenting cases were non-acute dental problems (caries and gingivitis) and that women consulted more frequently than men[10]. Contrary to expectations, dental trauma accounted for only 7% of cases[10]. Given that non-acute dental conditions account for the major burden of oral health in disaster situations,[10] the priority at the outset should focus on the prevention of the caries and periodontal disease. The latter can simply be prevented by continuing with regular (twice daily) tooth brushing using correct techniques to ensure removal of plaque from gingival crevices. The former requires continued use of a fluoride toothpaste (adult 1500ppm and child 1000ppm depending on levels of water fluoridation).[6] In addition the family in the proposed scenario, needs to ensure that they maintain a low cariogenic diet by avoiding high frequency of intake of Non Milk Extrinsic Sugars (NMES).[6] This may not always be possible depending on what food is available to them at this stage of the complex emergency whereby a good nutritional intake will be more important. If aid agencies are the

primary source of food then the level of NMES can be controlled by ensuring that the food packs given to the family are nutritionally high and low in cariogenic substances. If NMES sugar intake cannot be avoided then appropriate advice needs to be given to reduce the frequency of intake by restricting consumption of NMES to mealtimes[6]. The practicalities related to delivering oral health advice and oral hygiene aids need a co-ordinated response. PAHO[6] recommend that a coalition of international organizations with a stake in oral health (dental associations, dental schools, non-profit organizations, private organizations, and industry), and spearheaded by a neutral organization, should convene to implement a joint disaster response[6]. They also recommend that the team leader should be someone based in the country where the disaster occurred to ensure sustainability and acceptability of the oral health interventions implemented[6]. In the acute phase such a coalition would need to conduct a rapid short-term needs assessment of the affected oral and dental services and mobilize dental equipment, supplies, materials, and the volunteer personnel to implement oral health advice and oral hygiene aids as discussed.

Intermediate phase

By their very nature complex emergencies are unpredictable[3] and staying at home poses a huge threat to personal security given that modern conflict strategies include targeted violence towards civilians[10] and often involve cutting off medical supplies, food, water, electricity and fuel [11] to the same.

It is likely that in the intermediate phase the family will be forced to flee from their home but remain uprooted in their country probably in a camp with other internally displaced people (IDPs) [12]. This has several disadvantages:

1. Disruption of family - loss of home; men often drawn into conflict and separated from women and children.
2. Psychological trauma - through loss of loved ones and inability to trace them[13].
3. Loss of identity and belongings through constant movement, religious persecution and torture [14].
4. Health – the children and elder will be prone to:

   Malnutrition diseases (Vitamin A deficiency blindness, anaemia, rickets, marasmic babies, scurvy, beriberi etc); measles (crowding in camps); acute respiratory infections particularly prevalent in under 5's in emergency situations; diarrhoeal diseases like cholera (poor sanitation)[11,13,14].
5. Shelter: crowded spaces increase exposure to communicable diseases and insecurity from sex and gender based violence [11,12,14] and associated sexually transmitted diseases (HIV). Also lack of privacy for breast-feeding in camps.
6. Loss of independence through over-reliance on aid agencies for food, unemployment and loss of the right to go home depending on length of the conflict [14].
7. Loss of social network – particularly the case for the elderly member [14].
8. Loss of hope – this event is likely to overwhelm the family as it is beyond their control.
9. Insecurity- still at the mercy of the warring factions as no UN resolutions in their favour given that they are still within their country [14].

Oral Health Needs and relevance in the intermediate Phase

This phase could see a rapid deterioration in Oral Health. Dental caries is strongly related to deprivation [15] and an onset of caries in the camps would be a very good early indicator of levels of deprivation in the camps. It is probable that oral hygiene aids like toothpastes and toothbrushes have not been carried by migrating families and will not be immediately available in the camps. Nutritionally, the type of food eaten may not be relevant due to scarcity and high cariogenic diets may prevail. As discussed previously, the primary source of food is likely to come from aid agencies and it will be their responsibility to ensure that items in the food packs are not cariogenic. Further, aid agencies at this point could do much to prevent dental diseases by providing oral health packs the contents of which are discussed later in this paper. The oral cavity at this stage would not only be a good indicator for levels of deprivation but would also be a warning sign for key systemic diseases that are likely to develop in this phase:

1. Sexually transmitted diseases (STDs): Levels of these are likely to be high due to Sexual and Gender Based Violence (SGBV) and promiscuity in camps[16,17,18]. Oral presentations of these can aid early diagnosis e.g. oral thrush (pseudomembranous candidiasis) and hairy leukoplakia can be indicators for HIV progression[19]. Lesions that signify late stage of the disease include Kaposi's sarcoma (often observed in the palate) and Burkitts Lymphoma[19,20].
2. Malnutrition diseases: Kwashiorkor, marasm and micronutrient deficiencies (anaemia, Iodine and Vitamin A) may be observed. These will present in the oral cavity as angular stomatitis (crusting at the corners of the mouth), glossitis (red shiny tongue) and oral ulceration[21].

3. Trauma – facial fractures and fractured and avulsed teeth will also need immediate management as these can quickly develop into abscesses and lead to life threatening facial infections[22].

As per the acute phase, the co-ordinated oral health response discussed would have conducted a rapid short-term needs assessment of the affected oral and dental services and mobilized dental equipment, supplies, materials, and the volunteer personnel[6]. In the intermediate phase dental personnel would need to conduct dental examinations of victims to not only allow early detection of oral lesions which may indicate the presence of systemic disease, but also identify traumatic dental injuries which can be immediately managed to prevent life threatening facial infections and improve quality of life[22].

Medium to long term rehabilitation phase

Populations may well be unstable and frequently on the move. By this time international relief agencies are on the scene and may be in the process of relocating victims from make-shift camps into better housing. Similar diseases as in acute emergency phase will manifest but key differences will include chronic malnutrition if food supplies are not available and the onset of psychosocial issues as the victims begin to acknowledge and recognize the extent of their losses.

If the family crosses the borders of their country international agencies like UNHCR will have easier access to protect their human rights. However as humanitarian organizations scramble to set up adequate facilities, the families are likely to be exposed to the threats of diseases, malnutrition, and shelter discussed above for IDPs as they will initially be sheltered in 'make-shift camps to isolate them from the local population and allow distribution of relief supplies'[3]. The main advantages over being an IDP will be security from the conflict. Psychosocial traumas of losing their home

and identity will be similar although moving as a unit will help keep the family together. Indeed hope of starting a new life under international protection may spur them and the 37 yr old father will gain his self-esteem and protective role for the family. Support networks are more likely to develop with other similarly affected refugees belonging to the same cultural background. This will strengthen cultural/religious identity and social networks.

However, several disadvantages in the long term as integration into local population begins:

- Health risks: increased levels of communicable (TB, HIV, hepatitis) and non-communicable (diabetes, cardiovascular) diseases [13,16,17,18].
- Poor housing (lead poisoning in migrant children in France [13,16,17,18])
- Language barriers compound isolation and affect health-seeking behaviours[13,16,17,18]
- Doing 'unwanted' high-risk jobs increases occupational hazards [13,16,17,18].

All this leads to added stress and depression and anxiety related disorders [13,16,17,18].

Oral Health needs and relevance in the long-term phase

The need to prevent dental disease through provision of oral hygiene aids has been discussed in the acute and intermediate phases discussed earlier. If such preventive measures have not been applied then it is likely that dental diseases like caries will be prevalent in these IDP and refugee populations. Severe caries will lead to pain, discomfort, disfigurement, acute and chronic infections, and eating and sleeping disruption as well as higher risk of life threatening dental abscesses. For children, caries will affect nutrition, growth and weight gain leading to, for example, lower levels of beta carotene, folate and vitamin C [5,21]. Therefore the failure to incorporate

oral health prevention into the acute and intermediate phase can lead to thousands of IDPs and refugees suffering intractable toothache and poor quality of life [5,19,20,21]. At this stage the presence of a dentist in the rehabilitation team can be crucial in improving quality of life for refugees afflicted by intractable toothache. The treatment options are likely to involve extractions. Where chronic malnutrition has led to oral ulceration[21], the provision of vitamins and difflam mouthwashes can begin to ease the pain from such lesions to allow appropriate intake of food. Dentists can also provide a sense of well-being by removing deposits of calculus and staining on teeth which can help restore some self-esteem in the victims of complex emergencies. The role of the dentist in prevention cannot be over-emphasised. This would include oral hygiene instructions, use of fluoride toothpaste and application of fluoride varnish[6]. Psychosocial stress is likely to manifest as chronic pain disorders and in the oro-facial region these will include temporomandibular pain dysfunction, burning mouth syndrome and persistent idiopathic facial pain[23]. In these cases the dentist needs to make an accurate diagnosis to avoid invasive and irreversible treatment like tooth extractions as such pain often mimics pain of dental origin. Psychosocial issues can also manifest as periodontal disease and patients will need appropriate counselling to re-instate adequate oral hygiene measures to prevent progression of this condition which eventually leads to tooth loss.

Oral Health packs

Based on the fact that poor oral health negatively impacts quality of life, the need for prevention of dental diseases in complex emergencies is critical. With this in mind the following items should be included into oral health packs which aid agencies may distribute to victims of complex emergencies in the acute and intermediate phases:

1. Toothbrushes – medium consistency
2. Fluoride toothpastes – 1000ppm for children and 1500ppm for adults
3. Corsodyl gel / mouthwash – for adult packs only
4. Difflam mouthrinse / spray – for adult packs only
5. Multi-vitamin tablets
6. Oral hygiene and anti-smoking leaflets

These packs are simple, light and relatively non-expensive and have the potential to prevent dental disease and alleviate pain from oral soft tissue lesions.

Closing remarks

This paper presents an overview of the importance of oral health in complex emergencies. It highlights the importance of maintaining general and oral health both in the acute phase and in the intermediate and long-term phases of such events which are increasing in frequency and are targeted towards vulnerable civilian populations. The overview of oral health in these situations has identified the need for encouraging dental personnel to be actively involved as members of rehabilitation teams that set out to manage these disasters. Furthermore, the simple oral health packs described can help in prevention of dental diseases and be readily incorporated as part of food packs distributed by aid agencies.

Oral Health can also act as a warning sign for systemic disease and deprivation and this has been explored in this conceptual paper. Good oral health can greatly improve quality of life through adequate nutrition and speech. Where aid agencies do not have dental members in their team they should attempt to source local dentists who may themselves be victims of the complex emergency[6]. They can quickly help in improving quality of life for victims by extracting carious and painful teeth as

necessary and also form part of an oral health education programme for aid agencies. They can also be the first to identify systemic diseases like HIV and may also play a role in identifying victims of abuse as non-accidental injuries can frequently present in the oro-facial region.

Globally, there is a need to develop structured training programmes to ensure readiness of dental professionals for deployment in disasters and emergencies. Whilst this has been previously explored[24-27], there needs to be a more structured approach with links to wider medical teams through NGO's. For example UK-MED provide extensive training and ensure accountability for professionals attending emergencies[28]. UK-MED hosts the United Kingdom International Emergency Trauma Register (UKIETR) which is a national database of professional who have been trained and are deployable to attend disasters and emergencies. This register is a unique opportunity to include dental professionals into disaster rehabilitation teams. Such initiatives should be a priority for future investment to ensure oral health is incorporated into disaster and emergency management. Indeed there is a drive to introduce disaster preparedness into dental school curriculums[29,30] and these need wider implementation such that dental undergraduates can understand their role in these situations and incorporate them into their clinical careers post-qualification so as to increase the critical mass of dental professionals participating in international disaster rehabilitation teams.

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