PREVENTION OF BURNS IN DEVELOPING COUNTRIES

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SUMMARY. Burns represent an important health and economic problem in Africa and in the developing countries. Prevention programs in the developing countries are still at an infant phase. It is well known that prevention includes surveillance with data analysis and reporting. With information campaigns, an effort can be made to use regulatory action, to educate the population and modify the environment. The aim of this paper is to identify the risk factors in communities in order to implement community-based burn prevention strategies, not only on the African continent but also in other developing countries. Effective prevention programs are highlighted. Evidence regarding adequate safety legislation with policing seems to show immediate effects with multi-party involvement and statistical decrease of injury and death. Three examples are discussed where political commitment is mobilised to ensure regulatory action. Other programs are cost-effective and have long-lasting effects, but they take time. Cochrane database system reviews highlighted the problems when people were encouraged to change their lifestyle. NGOs play a definite role in developing countries, and in Bangladesh and Pakistan efforts are being made to curb acid-throwing violence. Communities consist of many groups. There must be a societal responsibility to design products and environments so that people find it easy and convenient to behave in a safe manner, often referred to as “forgiving systems”.

Keywords: violence, risk factors, legislation, life style

Introduction

Public health intervention in the USA, Canada, Europe and Australia has already demonstrated that deaths due to homicide, traffic and other unintentional incidents (fire, falls, drowning) are preventable. The core public health strategy, or platform, that may be directed at injury reduction and prevention includes legislative, engineering and educational strategies, as well as environmental changes and community mobilisation.1,2

Over 300,000 people die every year from fire-related burn injuries worldwide. Millions more suffer from burn-related disabilities and disfigurements which have psychological, social and economic effects both on the survivors and on their families.3

A model for prevention

The public health model of prevention includes four steps, namely:

i. defining the problem (its size and scope);

ii. identifying causes (the etiology of the problem forms the foundation for theory; risk factors and protective factors provide important information about vulnerable groups);

iii. developing and testing interventions (feasibility and pilot studies);

iv. implementing and evaluating interventions.

Evaluation should answer the following questions:

a) What works and for whom?
b) Is the intervention cost effective and what will the consequences for the community or target groups be?

The situation in the developing countries

In the year 2000 WHO published a document showing fire-related burn mortality per 100,000 population.4 The Americas, Europe, East Mediterranean and West Pacific shared a 1.0-4.0 rate. Obviously burn prevention had already paid off, but countries in eastern Europe and South America with a lower socio-economic status still showed a higher rate. However, the rate in Africa and South East Asia was even higher (5.5-8.3). Here, wearing loose-fitting clothes while cooking on the floor with malfunctioning kerosene pressure stoves results in numerous female burns. This group is at risk also for fire being used for homicides and suicides.5

Rajeev Ahuja writes, “Developing countries have a high incidence of burn injuries, creating a formidable public health problem. High population density, illiteracy, and

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poverty are the main demographic factors associated with a high risk for burn injury. He estimated that India, with 1 billion population, has 700,000 burn admissions annually. On the same ground it can be estimated that South Africa will have 59,000 burn admissions per 45 million population per year. This is a very heavy burden on the budget of a developing country.

If one compares the causes of burns in South Africa to those of other developing countries, it is noteworthy that violence and assault in South Africa are behind 34% of burn admissions in adults. No other country shows this high percentage of assaults. In this case, the mode of injury is fire, hot liquids and chemicals. Alcohol abuse and drug misuse are contributing factors. Acid violence has been common for some time in countries like Bangladesh and Pakistan. Domestic incidents (30%) in all countries are still the major reason for serious burns, and the use of substandard cooking devices contributes significantly to this figure. The use of an open fire for cooking and heating remains a serious problem worldwide. Industrial accidents are not a major cause of burns, with the exception of substandard electrical wiring accidents. Again this problem is on the increase, as the rural population flocks to the cities in the developing countries. Unfortunately, people end up in informal settlements with very little infrastructure, gangs, poor policing, and drug trafficking. Violence and injury are daily occurrences. It is well known that oil-rich developing countries in Africa have a serious problem with oil pipe explosions and home fuel storage that result in major catastrophic injuries as well.

Looking at most health services in developing countries, the support and treatment of burn victims are substandard. Ambulances and pre-hospital services are non-existing, hospitals are understaffed and lack facilities. As a result, chronic diseases are neglected, and serious burns are often seen with uncontrolled epilepsy. Delays in hospital presentation are common because a large part of the population still relies on traditional healers for their daily healthcare. Not surprisingly, fire treatment for epilepsy and hot baths for mothers are still part of customs with disastrous outcome.

**What is the status of burn prevention in the developing countries**

Numerous articles are published each year to propose prevention programs for burn injuries. Requests for a national prevention agenda are made, and specific “burn prevention days” (or weeks) are often announced to raise awareness. A call for a professional burn group is made and tasked to produce a national registry. Governing politicians are pressured to introduce primary and secondary health care facilities to help establish centres of excellence. Rarely, but most successfully, legislation is passed and policing implemented to control illegal products. So the question remains: which programs are the most effective? Are they posters displayed in waiting rooms, radio messages, school lessons and talks in antenatal clinics, or is it education at market squares? Unfortunately all of these lifestyle changes are necessary, but they take time.

**Looking for evidence**

A Cochrane Database System Review on community-based interventions for the prevention of burns and scalds in children was published in 2004. Evidence indicating the successful roll-out of these counter-measures into the wider community is lacking. Community-based interventions in the form of multi-strategy, multi-focused programs are expected to result in a reduction in population-wide injury rates. This review tests this hypothesis with regard to burn and scald injury in children. Of 32 studies, only three met the criteria for inclusion. Only one of these three studies showed a significant decrease in paediatric burns and scald injuries.

Another Cochrane Database System Review was published in 2005 on the ‘WHO Safe Communities’ model for the prevention of injury in whole populations. Over 80 communities throughout the world have formally been designated as ‘Safe Communities’ by WHO. This was a model for coordinating community efforts to enhance safety and reduce injury. Only seven WHO Safe Communities, in four countries (Sweden, Norway, Australia and New Zealand) from two geographical regions have undertaken controlled evaluations using objective sources of injury data. Only in Sweden and Norway have Safe Communities resulted in significant reductions in injury rates.

**What is best?**

Implementing adequate safety legislation with policing shows immediate effect. There is usually multi-party involvement. Statistical decreases that reflect control and curbing of the problem and a sharp reduction in injury and death are very soon notable. Using the power of legislation without policing is toothless. But when police enforcement is applied, the illegal products are seized and arrests are made.

Over a period of ten years, starting in 1990 the disastrous effect of paraffin / kerosene stoves in South Africa was studied and investigated. Research indicated that these stoves were the cause of 24% of adult admissions to the Tygerberg hospital Burns Unit (Table I). Explosion of the
stove occurred in 15% of the cases and other causes of injury were involved in 9%. After serious campaigning and help from an NGO - the Paraffin Safety Association of South Africa (PASASA), which tests all paraffin stoves - legislation was passed to stop the manufacturing of these stoves. Very little happened for two years, because there was no policing, and then a sharp drop in admissions from paraffin stove accidents occurred. An enquiry showed that the outlets had realized that they were selling illegal stoves, so they stopped buying, and consequently selling them to the public. At least two big retail chains indicated that they were no longer selling paraffin stoves due to reports in the media about the unsafe stoves and the lack of approval by the South African Bureau of Standards (SABS). Another reason for the drop in the incidence of paraffin stove burns may have been the increasing availability of electricity. A patient profile in the same unit from 2003 to 2008 showed that the admission rate for paraffin stove accidents had dropped to 10%.

Other success stories with safety legislation in high-income countries resulted from a program in the USA in 1983, where the hot water temperature of all new home geysers was set at 49 °C (120 °F). Scald injuries dropped in five years from 5.5 to 2.4 cases per year. In Oklahoma City a smoke alarm program was established. After four years residential fires were reduced by 80%.

Discussion

There are three main strategies to reduce harm from burn injury:
1. Product design/modification
2. Environmental change/legislation
3. Education to bring about behavior/lifestyle changes

Product modification
1. Address unsafe cooking devices
2. Electrification of townships to avoid open fires
3. Thermostatic control in hot water cylinders

Environmental control
1. Improve housing where shacks (wood and plastics) are used
2. Provide access routes, fire breaks and water hydrants
3. Encourage people to have more than one exit to their shack

Educational measures
1. Educate communities
2. Awareness of burn injury
3. Improve social standards with skilled training
4. Fight poverty and unemployment

NGO, a success story

Globally, non-government organisations work in diverse and vast fields aiming at well-known problems. Unfortunately, not many NGOs are involved in burns.

Meeting Monira Rahman, who established Acid Survivors Foundation (ASF) in Bangladesh, is a tremendous honour. This courageous woman supports victims like herself who had acid thrown in their face. She has a huge following in her country and her Foundation reaches out with medical and legal assistance to the victims of this evil deed. In Pakistan a working group on Acid and Burn Violence together with other NGOs presented the Acid and Burn Crime Bill 2012 to an advisor to the Prime Minister on Human Rights in their country. They also decided to use all legal means to achieve their goal.

Conclusion

Prevention programs that rely on educational strategies alone are not very effective, especially in the developing countries. It is difficult to educate people in matters concerning safety, and knowledge does not necessarily lead to a change in behaviour. Dinesh Mohan sets out clearly that a community comprises many different groups of people, e.g. some who are upset because they have recently suffered a personal tragedy, others taking medications or drugs that alter their behaviour and perceptual abilities, those under the influence of alcohol, and elderly people whose motor and cognitive functions are impaired. One could add those who are worn down by poverty and the daily struggle to make a living. Mohan holds that “we have a societal responsibility to design our products and environment so that people find it easy and convenient to behave in a safe manner. The systems must be such that they are safe not only for normal people but also for those individuals who might belong to any of the groups listed above. These kinds of designs, rules and regulations would reduce the probability of people harming each other or themselves even when they make mistakes. Such systems are very often referred to as “forgiving systems”.

Prevention of burn injury is the key. In the developing countries effective prevention programs face barriers to their implementation. Adequate safety legislation and policing prove to be the best ways. Thoughtful interventions have reduced burn morbidity and mortality in high income countries. In low and middle income countries it is time to coax partners and governments to do the same.
RÉSUMÉ. Les brûlures constituent un problème sanitaire important et économique en Afrique et dans les pays en développement. Les programmes de prévention dans les pays en développement sont encore à la phase initiale. Il est bien connu que la prévention comprend la surveillance associée à l’analyse des données et le reportage. Il faut réaliser des campagnes d’information et faire des efforts pour utiliser correctement les mesures réglementaires, éduquer la population et modifier l’environnement. Le but de cet article est d’identifier les facteurs de risque dans les communautés afin de mettre en œuvre des stratégies communautaires de prévention des brûlures, non seulement dans le continent africain, mais aussi dans les autres pays en développement. Les programmes de prévention les plus efficaces sont mis en évidence. Les expériences passées indiquent que pour ce qui concerne les questions de législation dans le secteur de la sécurité adéquate il semble que l’intervention de la police produit des effets immédiats, avec une participation pluripartitaire et une réduction statistique dans le nombre des personnes lésées ou décédées. Trois exemples sont présentés où l’engagement politique est mobilisé pour garantir une action réglementaire. D’autres programmes sont rentables et ont des effets durables, mais ils prennent du temps. Le système des données de base Cochrane a mis en évidence les problèmes quand les gens ont été encouragés à modifier leur mode de vie. Les ONG jouent un rôle précis dans les pays en développement, et au Bangladesh et au Pakistan on fait de grands efforts pour freiner la violence de la pratique de lancer l’acide dans la rue. Les communautés sont composées de personnes communes de tous les groupes sociaux. Il doit exister un sens de responsabilité sociale afin de projeter des produits et des environnements qui permettent aux personnes communes de se comporter d’une manière sure. Ces systèmes sont définis “les systèmes qui pardonnent”.

Mots-clés: violence, facteurs de risque, législation, style de vie

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