Rescue and Resuscitation in the South African Surf Zone.
Efficacy of the South African Lifesaver and Current Challenges.

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OBJECTIVES

To determine the efficacy of cardiopulmonary resuscitation (CPR) as performed by South African Surf Lifesavers, as well as the predisposing and contributing factors leading to drowning and near-drowning in surf conditions, in order to facilitate primary prevention and enhance the efficacy of this community-orientated service.

METHODS

The resuscitation records were examined for the period March 1978 - February 1995 (17 years) of 52 lifesaving clubs that oversee coastal beaches in South Africa. Demographic, clinical and rescue details and outcome were the broad categories of data recorded. Outcome measures included success of resuscitation, alcohol detection on the breath of the victim and corroborative subjective enquiry from club committees.

RESULTS

There were 75 males and 24 females with an age range of 15 months to 84 years with a skew to the younger age groups. Immersion in the surf was the most common single cause necessitating resuscitation (65%). In 63 (64%) victims, resuscitation was commenced within 5 minutes. In 68% the duration of resuscitation was under 30 minutes. The pulse was absent in 56 victims, present in 40. Overall, resuscitation was successful in 52 victims (53%), unsuccessful in 41 (41%) and undetermined in 6 (6%). If a pulse was absent, the relative risk of unsuccessful outcome was a high 26.7. Alcohol noted on the breath was unrelated to success of resuscitation. If the incident and rescue occurred between bathing beacons, the likelihood of successful resuscitation was significantly increased.

DISCUSSION

The causes of drowning and requirements for resuscitation as experienced in the surf zone of South Africa are heterogenous. Clearly many different people from all walks of life and with widely differing surf knowledge and ability are prone to immersion and rescue by lifesavers. The competent free diver getting into trouble from over-breathing to the non-swimmer, alcohol abuser and infant are examples of the extremes of this spectrum. Although initially diagnosed as the direct cause of collapse in only one person, alcohol was noted on the breath of 34 / 99 victims (which includes children). If the figures are analysed for the age groups ∃ 21 years of age the percentage consuming alcohol becomes 54%. Although this was shown not to affect resuscitation outcome per se, it may be reasonably concluded that despite being frequently detected, it is probably severely under detected bearing in mind the crude subjective diagnostic method and that it may be a very common cause of people getting into trouble in the water. Apart from underestimating their swimming capabilities if under the influence, alcohol use may also precipitate cardiac arrhythmias, cardiac arrest, seizures and errors in judgement, all of which may necessitate a rescue effort. Alcohol has been aptly named the Aubiquitous catalyst in predisposing people to submersion and drowning≅ and has been implicated as a major factor in the many secondary causes of drowning. Our own data, both from resuscitation instances (in about half the adult cases) as well as from public behaviour on the beach witnessed by lifeguards (75% of the surveyed clubs) underscores this concept.

Interestingly the presence of alcohol on the breath did not influence the outcome of resuscitation. A comparison with a recent Australian study is appropriate here. Their incidence of alcohol on breath was 21% (compared to our local figure of 33%) which also did not affect resuscitation outcome. Very similar findings were noted by the Canadian Lifesaving Society in their 1996 edition of the National Drowning Report wherein alcohol beverages were involved in 36% of all preventable water-related deaths in Canada.

The second major message of the data involves the bathing between appropriately demarcated zones. Of the resuscitations performed between the lifesavers= beacons,

76% were successful, whereas of those performed outside these areas only 35% were successful. Speculation would yield a number of possibilities such as distance from the lifesavers (in the role as first aiders with emergency equipment) being a factor, more dangerous surf conditions and longer time lapse until victim=s plight was recognised. Almost identical findings were found by Fenner et al in their study from Queensland, Australia.

The study also provides crude data on an unselected out of hospital population requiring CPR and initial survival statistics. The 52% is in sharp contradistinction to the less than 10% survival rate after in-hospital cardiac arrest with resuscitation. The hospital environment is where most medical practitioners have had experience with CPR and it is important not to compare the relatively dismal outcome in the Aailing≅ in-hospital patient with the people requiring resuscitation in a recreational circumstance such as in the surf zone.

As a very important early prognostic indicator, the presence of a pulse at the time of initial assessment was a powerful predictor of outcome. The absence of a pulse equated to a relative risk of 26.7 of unfavourable outcome.

The message from the analysis is clear. Young age, alcohol consumption and bathing in non-demarcated areas are the primary prevention targets readily amenable to public health education. The very strong relative risk ratio of no pulse at time of CPR initiation may indirectly reflect delay in getting to the victim in many cases. As Atime is brain,≅ the necessity for promoting bathing between beacons becomes all the more important.

The mailed questionnaire response from the club executive committees shows remarkable concurrence with what the incident forms have found over the 17 year period. The number one problem in terms of magnitude but not in terms of gravity, are marine stingers - colloquially named Ablue bottle≅ stings. Although many agents have been purported to be effective, the lifesaving fraternity remains relatively helpless at times of blue bottle invasions and again prevention and adequate public education must receive at-

tention for this distressing, albeit rarely dangerous or fatal, condition. The other important conditions identified by lifesavers were alcohol abuse in the beach environment and immersion either due to extrinsic (surf conditions) or intrinsic (poor judgement) factors. These priority issues are largely amenable to primary prevention.

In conclusion, the statistics tell a tale of efficient resuscitation with a success rate that is comparable to that of a similar study done in Australia, a first world country with a very different demographic profile. Not only can significant further improvement in outcome be gleaned from improving the skills and equipment of the rescuer, but also from the education of the Arescued≅. Appropriate adaptation to change for a successful organisation demands urgent public education regarding the dangers of non-adherence to bathing guidelines and the abuse of alcohol in a potentially hostile environment, such as water.