Randomized, Controlled Trial of Three Levels of Critical Incident Stress Intervention

Andrew Macnab, MD; Charles Sun, MD; John Lowe, Rev

Department of Pediatrics, University of British Columbia, Vancouver, British Columbia, Canada
British Columbia Ambulance Service

Correspondence:
Andrew Macnab
Room 2D19, British Columbia's Children's Hospital
4480 Oak Street
Vancouver, British Columbia, Canada V6H 3V4
E-mail: amacnab@cw.bc.ca

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Abbreviations:
BC = British Columbia
BCAS = British Columbia Ambulance Service
CIS = Critical Incident Stress
CISD = Critical Incident Stress Debriefing
EMT = Emergency Medical Technician
GHQ = general health questionnaire
PD = psychological debriefing
PTSD = post-traumatic stress disorder

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Abstract

Background: Stress debriefing following exposure to a critical incident is becoming more prevalent. Its aim is to prevent or minimize the development of excessive stress response symptoms that lead to loss of productivity or effectiveness in the workplace or at home. There is little evidence that any form of psychological debriefing is effective. This study evaluated the effectiveness of three intervention strategies, and attempted to correlate the symptoms with the severity of the incident and level of intervention.

Methods: A randomized, controlled trial of three levels of critical stress intervention was conducted in the British Columbia Ambulance Service (BCAS), in British Columbia, Canada, among paramedics and emergency medical technicians (EMTs), reporting critical incident stress. Outcomes were measured at one week (Stanford Acute Stress Reaction Questionnaire (SASRQ), the Life Impact Score (LIS), and Schedule of Recent Events (SRE)), and at three months and six months following the intervention (Impact of Events (IE), Coping Mechanisms, LIS, and SRE).

Results: Fifty calls were received during the 26-month study period (<1 per 10,000 BCAS response calls): 23 were by third parties, but the involved EMT did not call; nine were placed by crew unwilling to participate in the study; 18 subjects enrolled, but six completed no forms. No correlation was found between severity of the incident and scores on the SASRQ, IE, or LIS, or between any of these scores. There was no consistent pattern in the stress scores over time.

Conclusion: Requests for critical incident stress intervention were uncommon. The need for intervention may not be as great as generally is assumed. Further randomized trials, ideally multicenter studies, are indicated.

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Introduction

A "critical incident" or "traumatic event" is "any situation faced by emergency services personnel that causes them to experience unusually strong emotional reactions that have the potential to interfere with their ability to function either at the scene or later";[1] a disturbing event that is well outside the range of usual human experience; or an event that overwhelms the individual's normal adaptive and compensatory responses.[2] The DSM-III definition of post-traumatic stress disorder (PTSD) includes intrusive recollections of the traumatic event, numbing of responsiveness, and sensitivity to stimuli reminiscent of the trauma.[3] Other symptoms include guilt, problems controlling anger, anxiety, depression, and sleep disturbance, and instability in intimate relationships.[4]

Western society is extremely uncomfortable with the idea of people suffering symptoms of stress, and psychologists have responded by developing interventions aimed at alleviating or preventing the appearance of symptoms. The goal of stress debriefing is to prevent or minimize the development of excessive stress response symptoms that will lead to loss of productivity or effectiveness at work or at home. The debriefing formats, which include immediate debriefing (at the scene), initial defusing (within hours), formal debriefing (within days), and follow-up debriefing, have been developed empirically.[5] The implementation of critical incident stress debriefing is becoming increasingly prevalent, and has been introduced for counseling of individuals (rather than groups), and for those not directly involved in the incident. However, there is little evidence that any form of psychological debriefing is effective.[6,7] Also, "more" treatment not necessarily is better,[8] and there is some evidence that debriefing may do more harm than good.[9–11]

Almost all of the studies of psychological debriefing (PD) have had major design flaws, and there have been no adequate, randomized, controlled trials.[2,9,12] There is evidence that some of those who have participated in PD but didn't "need it" may have developed delayed symptoms.[10] Additionally, there have been suggestions that those who dissociate early on following a traumatic, stressful event, or who psychologically distance themselves from the incident (and therefore, don't seek intervention), also may be at increased risk of having delayed onset of symptoms.[4] However, at this time, the strongest evidence concerning the aftermath of critical incidents is that the outcome is determined largely by pre-existing elements of an individual's character and behavior.[5] A psychological predisposition to respond adversely, the presence of pre-existing coping strategies, extant support systems, and cultural bias in interpretation of events may be more significant factors in individual outcome than is the "severity" of the incident[12] or any subsequent intervention.

One study indicated that two years following the crash of an air ambulance with the loss of two pilots, a physician, and two paramedics, many of the Infant Transport Team paramedics, all of whom had had Critical Incident Stress Debriefing (CISD), still were negatively impacted by the event, as measured by the Impact of Events Scale and the general health questionnaire (GHQ).[13] This observation must be put in the context of a group in which 83%, by self-report, were "back to normal" at six months, and at six months were aware of no symptoms of PTSD occur in the general population. This discrepancy between an objective measure and self-report raised concern about the adequacy of intervention therapy.

Therefore, it seemed essential that a randomized, controlled study be conducted to evaluate the effectiveness of any intervention strategy intended to modify the impact of critical incident stress. It was hypothesized that severity of the incident, the level of intervention provided, and psychological sequelae were not correlated. A randomized, controlled trial was conducted of three levels of critical stress intervention with immediate, three month, and six month follow-up in the British Columbia Ambulance Service (BCAS).

Methods

The support of the critical incident stress debriefing coordinators and the union staff responsible for critical incident stress debriefing was obtained by involvement in the development, design, and implementation of the study. It was particularly crucial that the labor union to which the paramedics belonged, involved in, and was supportive of the study, as there always is the potential for distrust between the union and management. Through collaboration and consensus with the BCAS-CISD coordinators, a working definition of critical incident stress (CIS) was developed for the study, and the protocols for intervention were refined.

Letters describing the study, co-signed by the BCAS-CIS Program Coordinator and Chaplain and the Provincial CISD Coordinator for the labor union, were sent to all unit chiefs. Unit chiefs were asked to share the information with the paramedics and emergency medical technicians (EMTs) in their respective unit. Then, each unit was sent a sufficient number of informed consent packages to allow distribution to all of the members of the unit. Each package contained a description of the study, two copies of the informed consent letter, and a stamped, addressed envelope in which to return the signed informed consent. In total, 3,166 packages were distributed. Following the initial return of consent forms, each unit was telephoned or faxed reminders, notices were distributed reminding members to return their forms, and word-of-mouth techniques were used to encourage participation in the study. Posters were distributed to each ambulance station with a new 1-800 pager number for use throughout the province. A pamphlet on critical incident stress, its symptoms, and debriefing procedures was prepared and distributed to all of the stations.

For the first six months of the study, the five usual CISD telephone numbers (used in different areas of the province) were active along with the study contact number directed to a 24-hour pager. This was a union requirement for the study to proceed. After the first six months, when credibility had been established, the study pager number replaced the five other numbers, and became the only CISD contact number in the province.

When a call was received requesting critical incident stress support, the name of the caller was checked against the list of study participants. If the caller was not a participant, the caller was invited to participate. If the caller did not want to participate, s/he was referred to the Provincial CISD Coordinator. If the caller was a participant, s/he was asked to describe the incident (this provided the basis for the observer's scoring of the incident as "mild", "moderate", or "severe" (Table 1). Then, the caller was randomized to "mild", "moderate", or "severe" intervention, according to the study protocol. Mild intervention was a "listening ear" over the telephone and direction to a pamphlet describing the symptoms of the critical incident stress (pamphlets were sent to all stations). A moderate intervention was a "listening ear" immediately, direction to the pamphlet, and referral to a critical-incident stress coordinator for debriefing. A severe intervention was relevant only if more than one person involved in an event experienced CIS. A severe intervention consisted of defusing with others involved in

	Mild	Moderate	Severe
Fatalities	0	1–10	more than 10
Extrication	unnecessary	<30 minutes	>30 minutes
Rescue	<15 minutes	15–45 minutes	>45 minutes
Role	minor	moderate	handling dead or dismembered bodies
Arrival	timely	not timely	
Proximity to event	none		
Victims known to self	no		yes
Victims known to spouse	no	yes	
Victims known to children	no		yes
Reminded of knownperson/ situation	no	yes	
Similar magnitude	no	yes	
Number recent rescues	>20	11–20	0–10

Table 1—Severity of incident scoring system

the incident, and subsequent debriefing with a critical incident stress coordinator.

Questionnaires were mailed to the participants at one week, three months, and six months following the event. If the questionnaires were not returned within two weeks, the participant was telephoned to remind them to return the questionnaires, and another set of forms was mailed if requested according to the method described by Dillman.[14] The questionnaires that were mailed at one week included the: (1) Stanford Acute Stress Reaction Questionnaire; and (2) Life Impact Score and Schedule of Recent Events.[15] The questionnaires mailed at three months and six months included the: (1) Impact of Events;[16] (2) Coping Mechanisms; and (3) Life Impact Score and Schedule of Recent Events. Questionnaires were scored and correlations between scores and severity of incident were determined using Quattro Pro, Version 8 (Corel, Inc., Dallas, Texas USA).

Results

There were 13 calls to the pager during the first six months (2 per month) and 49 calls during the subsequent 13 months (3.8 per month), when the pager was the only CISD contact number. These calls included 12 wrong numbers, and attempts by callers to contact specific individuals (Figure 1).

Fifty BCAS-related calls were made to the pager. Twenty-three of the calls (46%) were made by an individual on behalf of another person who did not call, on behalf of a person for whom services were not available (bystanders, other emergency personnel), or about a personal problem (domestic or financial). Of the 27 potential subjects, nine did not consent to participate (33%). A total of 18 BCAS members were enrolled in the project; 12 completed the initial questionnaires (67%), and six completed the three sets of questionnaires (33%).

The severity of the incident was scored by the Study Coordinator according to a pre-determined set of criteria (Table 1). Of the 12 subjects who completed the forms, three (25%) were involved in mild events, five (46%) in moderate events, and four (33%) in severe events.

There was no correlation between the severity of the incident and scores on Stanford Acute Stress Reaction Questionnaires, Impact of Events, or Life Impact Score, or between any of the scores. There was no consistent pattern in stress scores over time among the six subjects who completed all of the questionnaires.

Discussion

While limitations to this study (particularly the low incidence of reported incidents warranting CISD) were recognized, the absence of any correlation between the severity of the incident and any of the scores or between any of the scores in the participants studied, is in keeping with the original hypothesis.

The number of individuals who contacted the CISD pager during the period of the study was low and far fewer than predicted by the BCAS or than were expected. Given that the BCAS had 650,000 calls during the period of the study (approximately 250,000 Code 2 and 250,000 Code 3 calls, Code 3 calls involve situations that immediately threaten life or limb—time is of the essence, red lights and siren used, and included 59,300 motor vehicle crashes, 67,300 trauma calls, and 3,700 cardiac arrests). Code 2 calls are those prioritized as less emergent—immediate response is required, but lights and siren are not used. A total of 116,500 calls (17.9%) were attended by part-time workers who had had less experience with severe incidents than did those employed full-time. Based on predictions from the literature, it was anticipated that several hundred incidents (>0.1% of total call volume) would involve critical incident stress and generate calls for assistance. The actual incidence of CIS reported either by the individual or a third party was 50/650,000 or <1/10,000 calls; and 23 of these were reported not by the involved individual, but by others, and five of the remaining 27 calls were not related to incidents at work.

Factors that may have contributed to this low incidence include reluctance on the part of union personnel to call a Study Coordinator, i.e., someone they do not know, despite this individual and the project having full support from the BCAS management, the union, and the BCAS-CISD

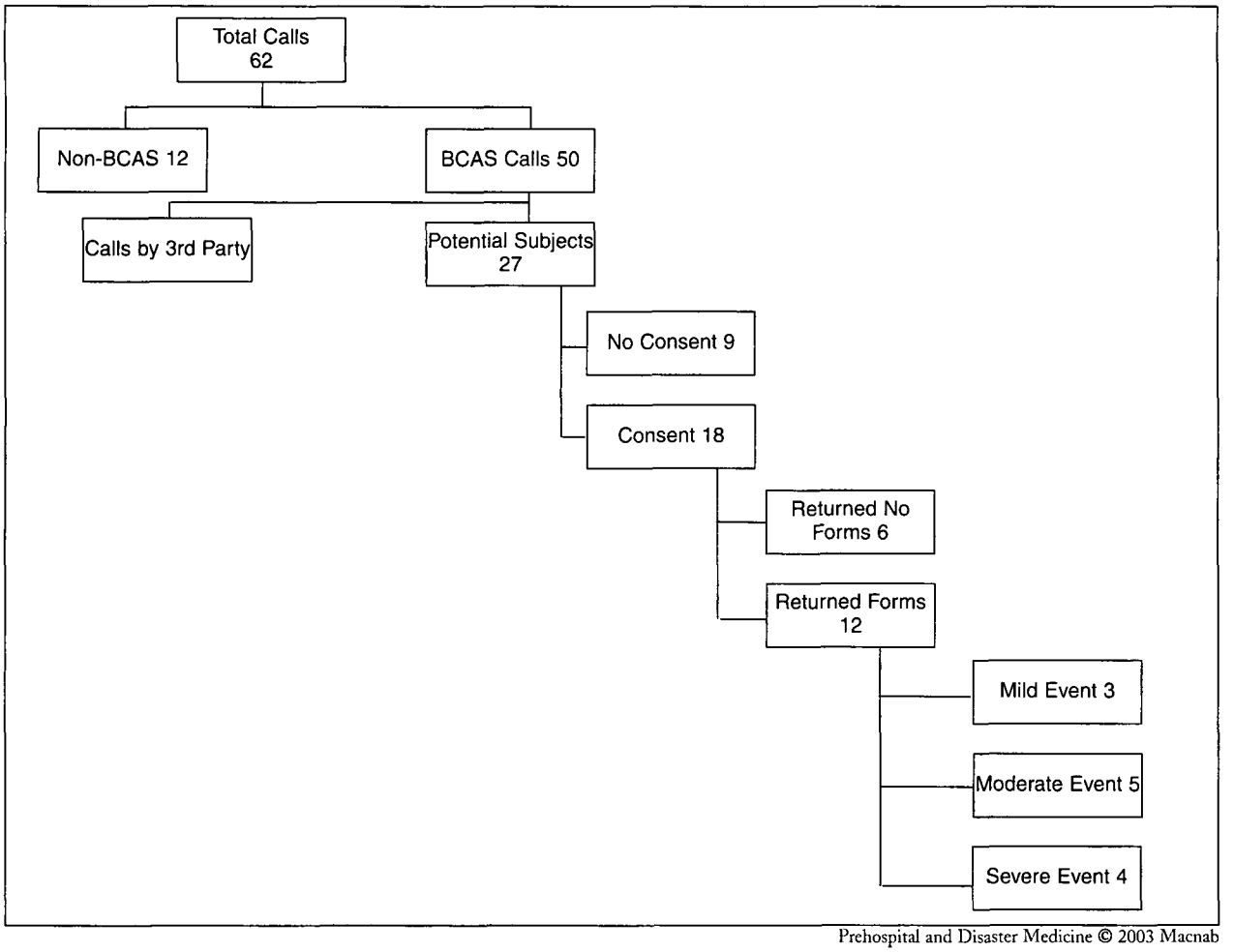

Figure 1—Breakdown of calls received by the study coordinator

group. Initially, the union only would support the study if the crews had access to the original pager numbers and the study pager number. That access choice was removed by the ambulance service six months into the study. For the remainder of the study, the only published number for the CISD team in British Columbia (BC) was the number of the pager carried by the Study Coordinator.

Only two calls were received about incidents that involved more than one EMT. In both instances, the call was placed by someone not directly involved with the incident. The crew members themselves elected not to call for CISD.

Potential causes for the low incidence of calls to the CISD hotline include:

1. The incidence of CIS actually is much lower than universally believed by society at large and the BCAS in particular;
2. It is possible that during the first six months, some calls were made to the previous regional CIS contacts. However, the BCAS-CIS contacts were asked and, in fact, there were no reports, this had occurred. By their own reports prior to the study, the regional CIS contacts rarely, if ever (once or twice per year), received requests for intervention;
3. There may have been reluctance on the part of the BCAS crew members to call an individual identified as a Study Coordinator. However, information sheets that contained the pager number also contained the number for the Program Coordinator for CIS for the BCAS, who, had he been contacted, would have channeled the call to the study, as he was a co-investigator;
4. Crew members may have been unable to recognize CIS in themselves, and therefore, failed to request intervention. However, the consequences of stress and how to recognize it are an integral part of BCAS training; and
5. This study depended on self-reporting/referring. There was no process that initiated a "mandatory" call for a perceived "severe event". However, during the study period several events occurred that were reported in the media or were common knowledge in the ambulance service, and none of these generated a call. Examples of these incidents include: (1) a tug/pleasure boat collision following a fireworks display; (2) an event in which two children were murdered by drowning; and (3) a multiple-vehicle crash for which a debriefing was initiated locally without any of the involved EMTs requesting assistance.

There was no correlation between the severity of the incident and the scores on Stanford Acute Stress Reaction Questionnaires, Impact of Events, or Life Impact Score. Stress scores showed no particular pattern among the six subjects who completed all of the questionnaires, although none of these individuals received formal CISD. Because enrollment was lower than predicted, there was insufficient power to make any distinction between different levels of intervention, which is disappointing as it was the major aim of the study. However, overall, the study result is valuable, in that it underlines that while a process for CISD is necessary, it is a resource which, within the ambulance service at least, is unlikely to require major resource allocation above the present level.

With the current level of understanding, the widespread application of critical incident stress debriefing is difficult to justify.[7] Until we can document both short-and long-term benefits with well-designed studies, extreme caution must be used in the provision of psychological debriefing.[17]

This study supports the concept presented in recent reports on stress in emergency medical services workers that one of the most useful approaches likely would be provided by prophylactic measures: providing high-risk trainees (e.g., emergency services, military) with instruction on stress management, encouraging routines that optimize adaptive physiological, emotional, and behavioral responses as part of daily life, and using these techniques as the foundation for managing subsequent stressful situations that are extreme or prolonged.[17,18]

In addition, this study demonstrates a workable methodology for prospective CISD studies. The measures selected are validated, even though comparisons between treatment interventions could not be made due to insufficient power in the population recruited.

Conclusion

In this prospective study, requests from EMTs for critical incident stress intervention were uncommon. The need for CISD in emergency services may not be as great as generally is assumed. Further randomized trials, ideally multicenter studies, are indicated.

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