

Violence: Recognition, Management, and Prevention

FREQUENCY AND RELATIONSHIP OF REPORTED SYMPTOMOLOGY IN VICTIMS OF INTIMATE PARTNER VIOLENCE: THE EFFECT OF MULTIPLE STRANGULATION ATTACKS

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□ **Abstract**—The objective of this study is to examine the correlation between the number of times a victim of intimate partner violence (IPV) has been strangled and symptom development subsequent to the attacks. One hundred and one female subjects responded to a series of questions regarding the history and characteristics of the strangulation and the development of specific medical symptoms. Multiple strangulation victims, individuals who had experienced more than one strangulation attack, on separate occasions, by the same abuser, reported neck and throat injuries, neurologic disorders, and psychological disorders with increased frequency. Despite the increased frequency of symptoms, only 39% of the multiple strangulation victims sought medical care. These observations strongly support the need for health care professionals to inquire about the incidence of strangulation, examine the victim closely for evidence of injuries caused by the attacks, and recommend immediate care in anticipation of the potentially long term medical needs. © 2001 Elsevier Science Inc.

□ **Keywords**—intimate partner violence; strangulation; abuse; medical symptoms and multiple attacks; violence

INTRODUCTION

Each year, approximately 1.5 million women in the United States (US) are the targets of a violent assault by an intimate partner (1). Kyriacou et al. reports that inti-

mate partner violence (IPV) is the most common cause of nonfatal injury to women in the US. Victims of intimate partner violence are pushed, punched, kicked, strangled, and assaulted with a variety of weapons with the intent of causing pain, injury, and emotional distress (2).

Until recently, reports of manual strangulation as a form of injury inflicted upon victims of IPV were virtually non-existent in the medical literature (3,4). Manual strangulation, also known as throttling, is the compression of the neck with one or two hands that may result in the restriction of blood flow and oxygenation to the brain (5). Strangulation can also result in injuries to the soft tissue, esophagus, and spine.

Wilbur et al. reported that 68% of the women surveyed reported having been strangled on at least one occasion. Manual strangulation was the most common method of reported strangulation abuse. Of the women surveyed, only 29% of the strangulation victims sought medical help after being strangled. Furthermore, only 5% of these same victims required hospitalization for strangulation related injuries, including respiratory distress and upper left extremity paralysis (4).

The study reported by Wilbur et al. showed that women who have been strangled report that they experience a myriad of clinical symptoms, including loss of

consciousness, scratches on neck, vision changes, dysphagia, neck pain, and psychiatric problems that include depression and Post Traumatic Stress Disorder (PTSD). Many of the survey respondents reported being strangled more than once. The purpose of this descriptive study was to determine whether there exists a correlation between the number of times a victim of IPV has been manually strangled and the frequency of symptom development during the two weeks following the attack(s).

MATERIALS AND METHODS

Study Design and Subject Recruitment

This research utilized a cross-sectional, observational study design, including three data sets compiled through August 2000 at the University of Texas Southwestern Medical Center. Survey respondents were recruited from the Parkland Health and Hospital System (PHHS), Violence Intervention and Prevention (VIP) Center, and Emergency Department (ED) in Dallas and domestic violence shelters in Dallas/Fort Worth, Texas and Los Angeles, California. The researchers conducting the interviews were trained to ensure consistency during the survey administration and data collection.

Female subjects were recruited for participation in a "study regarding violence." Care was taken to assure that no indication of the specific nature of the study or the researchers' interest in strangulation events was disclosed to the subjects during the administration of the survey. Criteria for inclusion in the study included female gender, age greater than 18 years, and current or previous involvement in an abusive relationship. Surveys were administered to English and Spanish speaking subjects. Each subject was advised that participation was voluntary and the interview could be terminated at any time. Study volunteers were provided written consent and received the investigator's guarantee that their identities would remain confidential.

Subjects were instructed to direct their focus to the events that occurred two weeks subsequent to the strangulation episode and respond with either "yes" or "no." Numerical values of 1.00 and 2.00 assigned to the yes or no responses, respectively, facilitated data analysis. An affirmative answer to a question regarding the development of a specific medical condition was followed by inquiries to determine whether the reported symptoms were related to an existing condition before the strangulation event. In addition, each subject was asked to report notable changes in their existing medical conditions following the strangulation event.

Data Set Description

Data set number 1 was collected from a population of women housed in domestic violence shelters in Dallas, Texas and Los Angeles, California as well as the Violence Intervention and Prevention Center at Parkland Hospital in Dallas. Information collected in data set number 2 was collected from subjects in the ED at Parkland Hospital in Dallas, Texas. Data set number 3 was gathered at a domestic violence shelter in Fort Worth, Texas. In each data set, identical surveys were used to maintain consistency of survey information collected.

Information extracted from each data set included survey responses from female subjects reporting a history of strangulation and medical complications or symptoms that developed during the 2 weeks following the strangulation attack(s). Data extracted from the three secondary data sets for analysis in this study focused on the characteristics and the development of specific medical symptoms related to the physical and mental health of the subjects.

Description of Analytic Techniques

Survey data were entered into a Microsoft Excel database for analysis. Data from the strangulation surveys were sorted into each of three categories based upon the reported number of strangulation attacks experienced by the victim at the hands of an abusive partner. The defined categories included: Group 1 (1 strangulation event), Group 2 (2–5 strangulation events), and Group 3 (>5 strangulation events). An analysis of the existing data was performed to determine whether the increased number of attacks was coincident with an increase in the frequency of development of specific medical disorders. For this study, Groups 2 and 3 (multiple attack groups) were analyzed against Group 1 (the single attack group). Descriptive statistics, analysis of variance and *t* test analyses were performed using Microsoft Excel and the Statistical Program for Social Sciences (SPSS) software packages on an IBM 300 GL computer system. Percentages reported are "valid percents" and exclude missing or unanswered data.

Values displayed in Figures 1 through 3, percent change from control, are determined by using the following formula:

$$\text{Percent change from control (\%}\Delta\text{)}$$

$$(\% \Delta) = \frac{\text{frequency of reported symptom (Group 2 or 3)} - \text{frequency of reported symptom (Group 1)}}{\text{frequency of reported symptom (Group 1)}}$$

(All calculations were derived using "valid percents.")

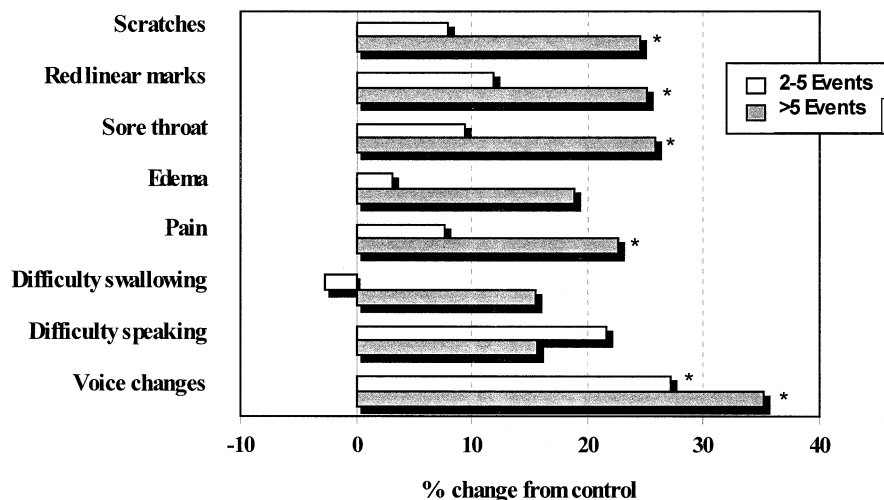


Figure 1. Neck and throat injuries associated with the strangulation attacks of multiple attack victims. Values are calculated as the percent change from control (described in MATERIALS AND METHODS section) for Group 2 subjects (solid bars) and Group 3 subjects (hatched bars). Statistically significant differences are indicated by a star (*) as appropriate.

RESULTS

Multiple Strangulation Subjects Report an Increased Incidence of Neck and Throat Injuries

Survey responses consistently indicated that neck and throat injuries were common. Reported changes that were experienced by the victims included soreness, edema, changes in the voice, problems swallowing and speaking. Single attack victims reported soreness in the throat (46.9%), neck pain (51.5%), and problems swal-

lowing (48.5%), indicative of the potential for injury that results from even a single event. However, as detailed in Figure 1, a comparison between Groups 2 and 3 and the control group (Group 1) indicates that the frequency of reported symptoms is significantly increased above the reported frequencies of the control group (1 attack). The values in Figure 1 (and Figures 2 and 3) are described as the percent change from control (calculations of the percent change from control are described in the Materials and Methods) and demonstrate the impact of

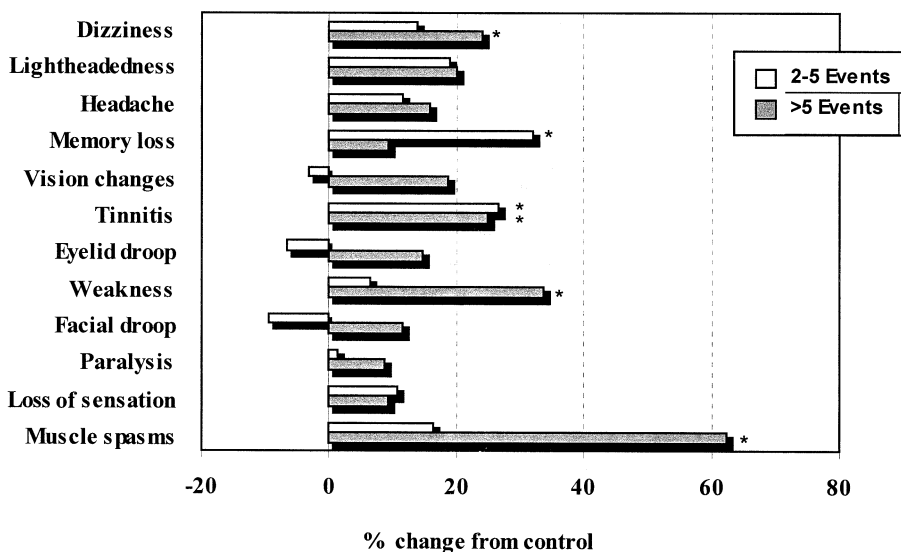


Figure 2. Neurologic symptoms associated with the strangulation attacks of multiple attack victims. Values are calculated as the percent change from control for Group 2 subjects (solid bars) and Group 3 subjects (hatched bars). Statistically significant differences are indicated by a star (*) as appropriate.

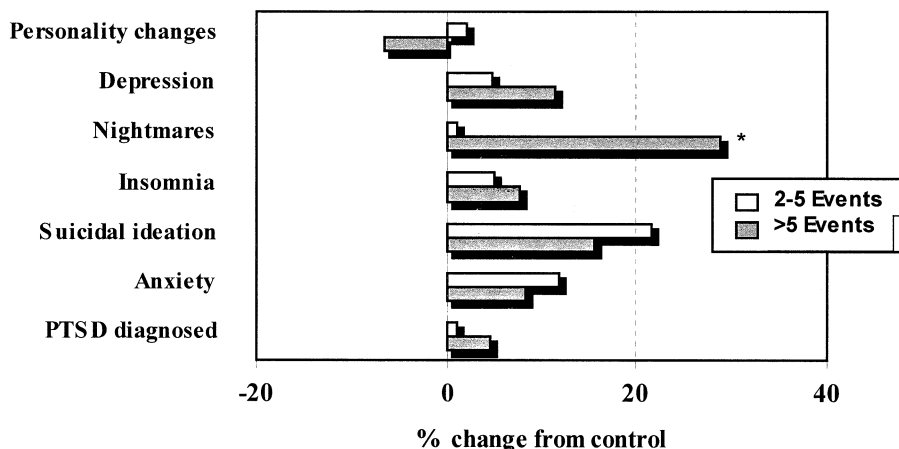


Figure 3. Psychological symptoms associated with the strangulation attacks of multiple attack victims. Values are calculated as the percent change from control for Group 2 subjects (solid bars) and Group 3 subjects (hatched bars). Statistically significant differences are indicated by a star (*) as appropriate.

multiple attacks. Investigators noted significant increases in reports of sore throat, voice changes, neck pain, and the appearance of scratches and red linear marks for Group 3 while reports of difficulty in swallowing and the presence of lumps in the neck appeared in all three groups with comparable frequency.

Multiple Strangulation Subjects More Frequently Reported Neurologic Disorders

Figure 2 details the changes in the frequency of reporting symptoms associated with neurologic systems. An increase in the frequency of symptoms consistent with the development of neurologic disorders was observed in the multiple strangulation groups. Victims reported symptoms that included dizziness, left or right side weakness, paralysis, headaches, tinnitus, lightheadedness, memory loss, and sensory deficits. Single attack victims reported the development of neurologic disorders, similar to the observations reported in response to questions about problems associated with the structure and function of the neck and throat. However, consistent with the hypothesis that the potential for injury increases with the increase in the cumulative number of strangulation attacks, victims in Group 3 reported significantly increased frequencies of development of dizziness, left or right side weakness, muscle spasms, and memory loss (Group 2).

Victims Report the Development of Psychological Disorders following Strangulation Attacks

The development of symptoms indicative of psychological disorders was compared between the three groups. Figure 3 details the changes in the frequency of reports of symptoms related to the development of psychological problems for each of the three groups. Responses from the subjects indicate that single event victims experience psychological symptoms during the two weeks following the attacks, similar to the observations described previously in this report. Fifty percent or more of the single attack victims reported the development of symptoms related to the psychological health of the victim in five of the seven survey inquiries. However, multiple strangulation victims (Group 3) reported significant increases in the frequency of nightmares.

Strangulation Victims Conservatively Self-Assess and Seek Treatment for Injuries Stemming From Attacks by an Intimate Partner

The results from the surveys show that each respondent reported the development of at least one medical condition subsequent to the strangulation attacks with the majority indicating that multiple conditions developed. Many of the survey respondents indicated that their injuries were sufficient in severity to be visible to family member(s) or friend(s) (Table 1). Yet, despite the overwhelming reports of a variety of developing medical conditions subsequent to the strangulation events, only 2% of the single attack victims and 27% of the multiple

Table 1.

| | 1 Event | 2-5 Events | >5 Events |
|-------------------------------------------------------------------------|--------------------------------|---------------|--------------|
| Sample size (n) | 44 | 34 | 23 |
| Survey questions | Valid Percent Responding 'Yes' | | |
| "Have you had any medical problems associated with the abuse?" (Yes/No) | 2.9 | 27.6 | 27.3 |
| | | $p < .009$ | $p < .012$ |
| "Were your injuries observed by anyone? (friends, family)" (Yes/No) | 48.8 | 70.6 | 69.6 |
| "Did you seek medical help following the attack?" (Yes/No) | 17.5 | 24.2 | 39.1 |
| | | | $p < .05$ |

attack victims responded with an affirmative answer to the survey question, "have you had any medical problems associated with the abuse?" Furthermore, only two of every five multiple strangulation victims (Group 3) 'sought medical care following the attack' at the time of symptoms. This percentage decreased to one of every four victims reporting five or less attacks (Groups 1 and 2).

DISCUSSION

Domestic violence is a broad categorization for a pattern of behaviors that include verbal insults, threats, psychological, emotional and economic attacks, and physical abuse that all too often leads to the death of the abused partner. Strangulation is one such form of physical attack that is often lethal (6–10). However, a larger percentage of the victims survive strangulation attempts that occur during the course of abusive relationships.

Domestic violence victims survive the numerous physical and emotional attacks at the hands of an intimate partner only to be re-victimized by their own altered health status. Head and facial injuries, orthopedic problems, stress related disorders, psychological disorders, and chronic pain continue to plague the survivor of domestic violence long after the abuse has come to an end. However, researchers and clinicians alike are now arriving at the same realization; namely, that strangulation victims are at increased risk for the development of these conditions that negatively influence their physical and mental health (11).

The study of the medical complications that are associated with strangulation was guided by the work of Strack and McClane who have devoted 4 years of study to this issue (see companion reports in this issue of JEM). Certain signs and symptoms consistently appear in the victims. Their work, coupled with the forensic literature, has provided a solid basis for identifying and characterizing the injuries and illnesses that appear to affect the health of the survivors of strangulation.

The most commonly reported injuries to domestic violence victims are injuries to the neck, throat and face (12–13). Given the significant numbers of victims that have been strangled by a partner, this observation should come as no surprise. Yet, while many victims present with no visible signs of injury, trauma to the neck can result in fractures of the hyoid bone, larynx, and tracheal rings as well as carotid tears and occlusions. Survivors of strangulation attacks frequently present for medical care with complaints of pain, swelling, and changes to the voice. However, the frequency of these problems is significantly increased in the population of victims that survive multiple strangulation attacks.

Of particular concern for the victims of strangulation attacks is the delayed development of edema in the neck. Initially, many victims show no signs of injury following a strangulation attack. However, swelling (edema) to the neck develops within 24 to 48 h of the attack and has the potential for lethality because of occlusion of the airways (14). One in three single attack victims reported the development of swelling of the neck, a frequency that increases to one in two for multiple strangulation victims. Medical staff treating patients with signs of edema should be vigilant to the possibility that the patient is a victim of an abusive relationship and that the potential for lethality is great. Close attention should be paid to the possibility of damage to the osseous and cartilaginous structure, the musculature, and the venous or arterial blood system.

Traumatic injuries to the neck can result in carotid dissections and occlusions, injuries that have been seen in attempted strangulation victims. The formation of lesions at the site of the carotid dissection can be the result of hemorrhaging associated with an intimal tear of the arterial wall. Patients may present with pain as the chief complaint with lesion formation as a delayed event. The lesion formation could potentially lead to the occlusion of the artery and a transient ischemic event resulting in a stroke. The delayed development should be of significant concern for attending medical staff as the possi-

bility for stroke, and its associated symptoms, is a concern (15).

Many of our victims reported that they had experienced one or more signs or symptoms that would indicate neurologic disorders. Furthermore, as the number of strangulation attacks increased, the frequency of reported development was significantly increased for many categories including dizziness, memory loss, tinnitus, and left or right side weakness. Presentation of a young female patient with signs of neurologic disorders would suggest a course of inquiry by the attending medical staff that searches for indicators of domestic violence and strangulation. These signs should serve to forewarn the medical staff that this patient has the potential for the rapid development of medical conditions that could significantly influence the patient's need for future medical care and impact the quality of life for the patient.

Victims of domestic violence routinely experience psychological disorders. Anxiety, depression, substance abuse, suicidal ideation, and sleep disorders are common among this population. The study subjects reported depression, personality changes, memory loss, insomnia, nightmares, and anxiety; symptoms associated with Post-Traumatic Stress Disorder (PTSD). Many of the first time strangulation victims reported that they had experienced one or more of the symptoms following the first attack. Furthermore, because of the high frequency of reported psychological problems by Group 1, the comparison of Groups 2 and 3 against the first group did not reveal any significant differences in the frequency of development of the various psychological disorders. However, two notable exceptions reported by multiple strangulation victims included an increased frequency of reports of nightmares and memory loss; conditions associated with patients diagnosed with PTSD. Furthermore, PTSD has been associated with changes in brain structure and function, specifically hippocampal volume loss (16).

Despite the self-reported incidence of a range of health problems experienced by the victims of strangulation, many still failed to recognize that changes in their health status that had occurred subsequent to the abuse. Ninety-seven percent of the single attack victims reported that they had no medical problems subsequent to the abuse. Among the multiple strangulation victims, the population most at risk for serious harm, only one in four reported any medical problems, despite the injuries that were significant enough to be visible to friends and family for every two of three respondents. Yet, the victims still do not seek professional medical care. Less than one of five attack victims experiencing five or fewer attacks sought medical care; a frequency that increases to only two of five survivors of more than five attacks.

The increased frequency of development of these signs and symptoms in multiple strangulation victims is cause for concern that these victims may exhibit an increased susceptibility to the attacks of an abusive partner. Also at issue is the concern that the patient is at risk for the development of permanent changes in physical or mental health status. These observations are strongly indicative of the need by professionals to be vigilant to the patient that presents with similar signs and symptoms, as these may represent the worst of the worst victims of abuse, victims unable any longer to ignore their medical needs. Investigation into the causes of the injuries and referrals to the necessary social services are indicated because of the severity of the violence and the potential for long-term disability, or lethality, associated with this form of violence.

This study has limitations. The sample is one of convenience and the information obtained based upon self-reporting of the subjects, which raises concerns about recall bias. A planned prospective study, to be conducted in our center, will address these issues to confirm the observations described above. Despite these limitations, the results strongly suggest that multiple strangulation events associated with an abusive interpersonal relationship are indicators of increased risk to the victim; risks with long term or lethal implications.

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