Brief report

Complicated grief in those bereaved by violent death: the effects of post-traumatic stress disorder on complicated grief

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Violent death, such as homicide, accident, and suicide, is sudden, unexpected, and caused by intentional power. The prevalence of complicated grief among those bereaved by violent death is 12.5% to 78.0%. The factors affecting this prevalence rate are considered to be comorbid mental disorders, lack of readiness for the death, difficulty in making sense of the death, high level of negative appraisal about the self and others, and various social stressors. Post-traumatic stress disorder is, in particular, considered to contribute to the development of complicated grief by suppressing function of the medial prefrontal cortex and the anterior cingulate cortex, which works at facilitating the normal mourning process. An understanding of the mechanism and biological basis of complicated grief by violent death will be helpful in developing effective preventive intervention and treatment.

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Introduction

Approximately 20 000 people lost loved ones in the Great East Japan Earthquake on March 11, 2011. Death caused by disaster is sudden and unexpected, and sometimes includes additional trauma, such as facing life-threatening situations and witnessing damaged corpses. Raphael[1] called these bereavements "traumatic loss," which is more stressful, complicated, and difficult to recover from than the bereavement of natural death. Under traumatic loss, death by homicide, accident, and suicide is called "violent death." This means death by intentional use of physical force or power, threatened or actual, against oneself, another person, or a group or community.[2] Rynearson[3] claimed that violent death comprised three Vs—violence, violation, and volition—and that these interfere with acceptance of death by the bereaved. Some studies have indicated that the prevalence of mental disorders, such as post-traumatic stress disorder (PTSD), complicated grief (CG), and depression among those who have experienced "violent death" was relatively higher than natural death.[4-10] Dyregrov et al[9] reported that the prevalence of PTSD (51% to 52%) and CG (78%) among survivors of suicide and accident. Violent death was associated with greater rates of PTSD

and CG than those experienced by sudden infant death syndrome (PTSD 34%, CG 57%).[9] In addition, the various negative emotions and cognitions, such as reprisal and guilt feelings and the socioenvironmental factors, including social reaction and stigma, that are associated with the aftermath of violent death, are considered to interfere with appropriate coping and contribute to persistent symptomatology. In terms of treatment, clinicians should consider interaction of these mental disorders and related issues. We focus on the characteristics of CG following violent death and the effect of PTSD on the complexity of grief symptoms.

Why is the prevalence of complicated grief after violent death higher than that after other types of death?

In the general population, the prevalence of CG in those who have experienced loss of significant others has been reported as 2.4%[11] to 6.7%,[12] which is relatively low, but prevalence is higher among those bereaved by violent death *(Table I)*.[9,13-16] One reason for this is that violent death is sudden and unexpected. Suddenness and lack of readiness for death were reported as predictors of CG among the general population.[11,17] Barry et al[18] indicated that a lack of perceived preparedness for death was associated with severity of CG.

Violent death is not only sudden, but, importantly, is caused by violence, and it is significantly different from natural death in terms of the way it is thought about by the bereaved family. Currier et al[10] reported that violent death made "sense-making" difficult. "Sense-making" is considered as an intermediate factor in that it is considered to help a bereaved family to accept death as a part of life. It is also responsible for the degree of severity of CG.[10] The negative cognitive appraisal for themselves, others, and the world was another important mediating factor between violent death and following mental disorders such as PTSD, depression, and CG.[16,19] In cases of violent death, the bereaved family is often exposed to the curiosity of the media and people around them, or may be slandered. Such experiences may affect the grieving process, as they could result in societal distrust, making it difficult for the bereaved to seek support, resulting in their social isolation. In fact, it was reported that bereaved families with mental disorders had a strong perception of being hurt by others after the death.[16,19] In addition, in the case of violent death caused by crime, the influences of the legal process cannot be ignored.[20,21] Legal proceedings such as police or attorney interviews and testimony in court might provoke psychological distress and PTSD symptoms by facing offenders, remembering details of the crime, and blame put on victims by defense attorneys.[20,22,23] The outcome of the trial also affects mental health; with regard to the families of a homicide or traffic crime victim; it has been reported that their low satisfaction with the criminal justice system was associated with severity of PTSD, depression, and anxiety.[4,24]

The effects of post-traumatic stress disorder on complicated grief

Numerous studies have reported that a variety of mental disorders, such as depression, PTSD, and other anxiety disorders, coexist in bereaved individuals with CG.[25-27] Simon

Cause of death	Author (year)	N	Prevalence (%)	Time since death (years)	Measurement
Violent death					
Bosnian conflict	Momartin et al (2004)[13]	126	31.0	5	CBI
Rwandan genocide	Schaal et al (2009)[14]	40	12.5	10	PG-13
September 11th attacks	Neria et al (2007)[15]	704	43.2	2.5-3.5	ICG
Homicide and traffic accident	Nakajima et al (2009)[16]	74	21.9	7.8	SI-TG
Suicide	Dyregrov et al (2003)[9]	128	78.0	1.3	ICG
Accident	Dyregrov et al (2003)[9]	68	78.0	1.2	ICG
Nonviolent death					
Cancer	Kersting et al (2011)[12]	216	10.1	9.8	German ICG-R
Disease	Kersting et al (2011)[12]	142	4.9	9.8	German ICG-R

Table I. Prevalence of complicated grief among those bereaved by violent or nonviolent death. CBI, Core bereavement items; PG-13, Structured interview for Prolonged Grief Disorder; ICG, Inventory of Complicated Grief; SI-TG, Structured interview for traumatic grief; German ICG, German version of the Inventory of Complicated Grief Revised

et al[26] indicated that 75.2% of patients with CG had at least one axis I disorder of *DSM-IV*. Major depressive disorder and PTSD were prevalent comorbid disorders. In those bereaved by violent death with CG, prevalence of PTSD was reported to be as high as about 43% to 65%[13,15,28] *(Table II)*. In circumstances of violent death, the bereaved frequently experienced life-threatening incidents or witnessed terrible scenes.[28] Such traumatic experience is considered to contribute to the increasing prevalence of PTSD among those bereaved by violent death. Some studies reported that the severity of CG and PTSD was significantly positively correlated.[12,14,19,25,29] It has been suggested that these conditions affected one other. In particular, intrusive symptoms of PTSD were associated with CG symptoms.[13] It was indicated that intrusion was the common symptoms of both PTSD and CG.[30-32] Findings from functional brain imaging also suggest the effect of PTSD on CG. It was reported that the amygdala, which was responsible for processing fear and anxiety, had exaggerated responses to general negative stimuli in PTSD.[33] Furthermore, less activation of medial prefrontal cortex (mPFC), anterior cingulate cortex (ACC), and thalamus in PTSD subjects than non-PTSD subjects during fear activation was reported in previous studies.[34,35] It was suggested that PTSD patients might have dysfunction of ACC and mPFC which played a role in suppressing excessive activity of the amygdala.[34] There were a few studies on brain function with grief. Subjects with acute grief, a condition close to CG, also indicated that intrusion accompanied by strong sadness elevated the activity of the ventral amygdala.[36] Therefore, the amygdala is responsible not only for feelings of fear, but also for separation distress. However, in contrast with PTSD, along with the elevated activity of the amygdala, the activity of the right ACC (rACC) was also elevated in grief subjects.[36] This study indicated that the functional connectivity of the amygdala and the rACC had a negative correlation with the degree of sadness.[36] The ACC and PFC play a role in the emotion regulation using cognitive reappraisal strategy.[29,37] It is therefore assumed that activation of the rACC at the acute stage of grief contributes to the promotion of the normal grieving process. It is thought that the low activation of ACC at the early stage of grief in bereaved with PTSD leads to dysfunction of emotion regulation, resulting in interference with the normal grief process and developing CG.

It was reported the activation of nucleus accumbens, related to the reward system, was associated with CG, which was correlated with strong yearning for the deceased without being able to accept the death.[38] Similarly, bereavement with PTSD is considered to be more difficult to accept the death than those without PTSD, because not only sadness, but also fear, might be evoked when recalling the deceased. In fact, it has been reported that PTSD, or its intrusion symptoms, was responsible for the severity of CG.[9,13,39,40] Those reactions work to disrupt the normal grief process and contribute to the onset of CG.

The effectiveness of cognitive behavioral therapy for CG, including exposure to death, serves as evidence for the effect of PTSD on CG.[31,41-43] Asukai et al[43] modified the CG therapy[31] for those bereaved by violent death, to focus more on an exposure exercises in traumatic situations, and reported that this modified treatment was effective for both symptoms of PTSD and CG. This result suggested that improvement of PTSD symptoms might act on reducing CG symptoms.

Cause of death	Author (year)	N	Rate of comorbidity (%) PTSD	MDD
Kosovar civilian war	Morina et al (2010)[28]	23	65.2	65.2
Not specified (help-seeking CG patient)	Simon et al (2007)[26]	206	48.5	55.3
September 11th attacks	Neria et al (2007)[15]	304	43.3	36.0

Table II. Comorbidity of post-traumatic stress disorder (PTSD) and major depressive disorder (MDD) with complicated grief (CG).

Conclusion

Violent death is not only sudden and unexpected, but threatens others by intentional power, resulting in significant impact on the mental health of bereaved persons. It was reported that there was 12.5% to 78% prevalence of CG[9,13-16] among those bereaved by violent death. The factors affecting such high prevalence of CG following violent death are lack of readiness for the death, difficulty in sense-making, a high level of negative appraisal about the self and others, and various social stressors, such as exposure to the mass media, social stigma, and legal procedures. The comorbidity of PTSD was particularly considered to contribute to the development of CG by suppressing the functioning of the mPFC and the ACC, which facilitates the mourning process when grief distress is activated and interrupts acceptance of death. The *DSM-5* working group is currently discussing whether CG as a bereavement-related disorder will be included

in axis I mental disorders. However, its symptomatology and the biological basis of its pathology are unclear. It will be helpful to clarify the effect of PTSD on CG among survivors of violent death for understanding the pathogenic mechanism of CG and developing preventive intervention and treatment of CG. ❑.

Duelo complicado en los deudos de fallecidos por violencia: los efectos del trastorno por estrés postraumático en el duelo complicado

La muerte violenta como el homicidio, un accidente o el suicidio es repentina e inesperada y causada por una energía intencional. La prevalencia de duelo complicado entre los deudos de quienes han fallecido por una muerte violenta es entre 12,5% y 78,0%. Se considera que los factores que afectan esta prevalencia son trastornos mentales comórbidos, falta de preparación para la muerte, dificultad para encontrarle sentido a la muerte, una importante evaluación negativa de sí mismo y de los otros y varios estresores sociales. Se considera que el trastorno por estrés postraumático contribuye en forma especial al desarrollo del duelo complicado al suprimir la función de la corteza prefrontal medial y de la corteza cingulada anterior, las cuales actúan facilitando el proceso de duelo normal. Una comprensión del mecanismo y de las bases biológicas del duelo complicado a raíz de una muerte violenta será útil para el desarrollo de intervenciones preventivas y tratamientos efectivos.

Deuil compliqué chez les endeuillés par une mort violente : effets du stress post-traumatique sur le deuil compliqué

La mort violente, à la suite d'un homicide, d'un accident ou d'un suicide, est brutale, inattendue et provoquée de façon volontaire. La prévalence des deuils compliqués chez ceux subissant une perte par mort violente est de 12,5 à 78 %. Les facteurs exerçant une influence sur cette prévalence sont les troubles mentaux associés, l'absence de préparation à la mort, la difficulté à donner un sens à la mort, un degré élevé d'évaluation négative de soi et des autres et différents facteurs sociaux de stress. L'état de stress post-traumatique participe en particulier au développement de la douleur morale compliquée en supprimant la fonction des cortex médian préfrontal et cingulaire antérieur qui contribue à faciliter le processus normal de deuil. La compréhension des mécanismes et des fondements biologiques du deuil compliqué à la suite d'une mort violente aidera à développer des actions et des traitements préventifs efficaces.

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