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Review

Suicidal behaviour and suicide prevention in later life



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ABSTRACT

Despite a general decline in late life suicide rates over the last 30 years, older people have the highest rates of suicide in most countries. In contrast, non-fatal suicidal behaviour declines with age and more closely resembles suicide than in younger age groups. There are difficulties in the detection and determination of pathological suicidal ideation in older people. Multiple factors increase suicide risk ranging from distal early and mid-life issues such as child abuse, parental death, substance misuse and traumatic life experiences to proximal precipitants in late life such as social isolation and health-related concerns. Clinical depression is the most frequently identified proximal mental health concern and in many cases is a first episode of major depression. Recent studies have identified changes on neuroimaging and neurocognitive factors that might distinguish suicidal from non-suicidal depression in older people. Strategies for suicide prevention need to be 'whole of life' and, as no single prevention strategy is likely to be successful alone, a multi-faceted, multi-layered approach is required. This should include optimal detection and management of depression and of high risk individuals as available evidence indicates that this can reduce suicidal behaviour. How best to improve the quality of depression management in primary and secondary care requires further research.

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1. Introduction

In 2013 it was estimated that 8.2% of the world population was aged 65 years and over, yet around 17% of suicide deaths reported to the World Health Organization were recorded in this age group [1,2]. However, suicide only accounts for a small proportion of deaths in older people; in contrast it is among the three leading causes of death in those aged 15–44 [1]. Self harm was ranked 13th in the all-age global causes of death in the 2010 Global Burden of Disease study, but in old age it was ranked much lower to be 17th at age 60–64 and by age 80 years and over it was ranked 32nd [3].

Research into the treatment and prevention of suicidal behaviour in old age is limited but there has long been broad agreement about many risk factors [4]. Depression and social isolation are the most consistent findings as independent risk factors for suicidal behaviour and these are often the factors that contribute to older people having problems in coping with the impacts of physical ill health and functional impairment, particularly in individuals who are challenged in their adaptation to ageing due to rigid, obsessional, or anxious personality traits [5]. Rapid population ageing worldwide and the recognition that factors associated with suicidal behaviour vary across the life cycle are drawing attention to this deficit.

This review examines suicidal behaviour in late life with a focus on recent research developments. Systematic reviews and book chapters on late life suicidal behaviour published since 2007 were supplemented by a search of Medline, PsycInfo and Embase databases from 2007 to 2013 using keywords (suicide, deliberate self harm, suicide ideation, attempted suicide, old, elderly, old age).

2. Epidemiology of suicidal behaviour in late life

Over the last 30 years an overall reduction in suicide rates in older people has been recorded [6]. Non-fatal suicidal behaviour declines with age and more closely resembles suicide than in younger age groups, having high levels of lethal intent, less impulsivity, and clinical features that are similar to those found in suicide [7,8].

The prevalence of suicidal ideation in old age varies across studies with the distinction between normal thoughts of death associated with ageing and common life events not adequately delineated from those that reflect psychopathology and increased suicide risk [4]. Recent studies illustrate this. In a study of general practice patients aged 60 years and over, the presence of suicidal ideation was associated with nearly 34 times increased risk of attempted suicide in the previous year [9]. A study of 97-year olds found that 77% of those acknowledging suicidal feelings did not meet criteria for depression [10] and a qualitative study found that older people with a wish to die originally developed thoughts about death as a positive solution to life events or adverse circumstances [11]. There is also evidence that suicidal thoughts in older people are associated with increased risk of mortality by natural causes [12].

Some pathways for late life suicidal behaviour begin early in life and it is often the interaction of distal with proximal factors that provides the lethal mix. There is limited understanding of how factors interact to determine risk in an individual [13]. The motivations that drive the final suicidal act are quite varied and access to an acceptable lethal means plays a critical role [14].

3. Demographic factors

Males have higher suicide rates than females across the lifespan and with advancing age the male to female ratio increases [14]. Females are at higher risk of non-fatal suicidal behaviour than

males but rates tend to converge with advancing age [5]. The evidence is inconsistent about whether suicidal behaviour is more common in those that are divorced or widowed [6,14].

There is heterogeneity of suicide rates between countries and ethnicity appears to be a factor with different suicide rates of ethnic groups within multicultural societies [6]. There is also regional variation within countries with higher rates reported in rural areas of some countries [13].

4. Early life factors

Childhood adversity, which includes physical and sexual abuse, parental neglect through death, separation and inadequate care, and traumatic life experiences such as the Holocaust, increases the risk of suicidal behaviour and mental disorders across the life cycle [6,7,13]. Genetic factors contribute to suicide risk by mediating transmission of impulsive aggression or neuroticism and neurocognitive deficits [15].

5. Personality traits

Personality traits are associated with increased suicide risk with the most consistent finding being increased neuroticism [13], although this is less than in middle-aged suicides [16]. Neuroticism might be a proxy for undetected depression in some individuals and this is supported by one study which found that the high level of neuroticism in older suicide attempters did not remain after adjustments were made for major depression [17]. Anankastic (obsessional) and 'low openness to experience' traits have also been reported; such individuals are comfortable with the familiar and have a constricted range of interests leading to difficulties in coping with the challenges related to ageing [13].

6. Neurobiological factors

Earlier studies in older people reporting increased suicide risk with serotonergic neurotransmitter abnormalities, non-suppression of the dexamethasone suppression test, and apolipoprotein E ϵ 4 (ApoE4) carrier status have not been replicated [13].

Older depressives with a history of suicide attempts are more likely to show cerebral atrophic changes than those without a history of suicide attempts, with one case–control MRI study finding widespread but discrete cortical and subcortical volume reduction [18] and a second study showing more discrete striatal lesions, particularly in the putamen [19]. More recently a functional MRI case–control study reported that impulsivity and a history of suicide attempts were associated with a weakened expected reward signal in the paralimbic cortex [20]. Larger studies are required to further elucidate these findings.

7. Neurocognitive factors

Impulsive suicide attempts have long been reported in older people with frontal executive dysfunction secondary to early dementia or mild cognitive disorders [13]. Most research into cognitive function, however, has focussed on older people with major depression with and without a history of suicide attempts. In a preliminary investigation for a series of case–control studies, poor performance on tests of executive function, attention, and memory were found to be associated with suicidal behaviour in older people with major depression [21]. Subsequent findings distinguishing older depressed suicide attempters from those without a history of suicidal behaviour included a perception of life problems as threatening and unsolvable and an impulsive approach to

problem solving [22] and a tendency to ignore past experiences and neglect outcome probability when making decisions that are overly present-focused [23,24]. A second research group found that older depressed suicide attempters have worse cognitive inhibition performance, especially on the motor component, than their non-suicidal depressed counterparts and this inability to inhibit intrusive information may predispose to suicide attempts [25]. There is also an inability to inhibit neutral information access to working memory and delete irrelevant information which may impair the capacity to respond adequately to stressful situations [26].

These cognitions may also interact with perceived burdensomeness, a component of the interpersonal-psychological theory of suicide, which mediates the relation between depression and suicide ideation, accounting for over two thirds of the variance in suicide ideation, even after predictors such as depressive symptoms, hopelessness, and functional impairment are controlled [27,28]. Together these cognitive factors may precipitate and perpetuate a suicidal crisis in depressed older people.

8. Physical health and disability

Physical health is a contributory factor in most cases of late life suicidal behaviour [13]. Vascular disease may predispose to late onset depression and this often has midlife antecedents such as hypertension, smoking, diabetes and metabolic syndrome. A case-control of suicides over age 50 years found that cerebrovascular risk factor scores were significantly higher in suicide cases [29]. It is unclear whether physical illness has an independent effect upon suicide risk and studies are inconsistent about the role of specific illnesses [13]. Some physical illnesses including cancers and thyroid disorders can cause depression and these might not be detected until after a suicide attempt. Chronic pain, breathlessness and functional impairment are frequently reported health features [13], with one study finding that the risk of suicidal ideation increased with pain severity and lack of pain control, particularly in men [30]. Psychological reactions may result in some people feeling overwhelmed by their health problems. Physical vulnerability also increases the risk that an older person will succumb to a suicide attempt. For example, an analysis of suicide attempts recorded in the National Trauma Data Bank in the United States from 1995 to 2002 found that mortality was higher in older people [31].

Medications such as anticonvulsants and sedative/hypnotics are also associated with an increased risk of self-injurious behaviour [32,33].

9. Psychosocial factors

Loss of social connectedness increases suicide risk independent of the presence of mental disorders [5,34]. Family discord is perhaps the most important factor [14]. In many cases the problems are chronic and males may be more vulnerable [14]. Other life events particularly those involving loss including recent bereavement and financial problems have been implicated in late life suicidal behaviour [7,14,35]. Low socio-economic status is a risk factor worldwide [14,35].

Living alone has consistently been identified and this is often regarded as a proxy for loneliness, social isolation, and lack of perceived social support [5,7,14]. It has been suggested that suicide rates are lower in Western European countries where older people live with their families more often and where there are less ageist societal attitudes than exist in Eastern European countries [36]. Spending too little time with children and grandchildren is associated with suicide attempts [37].

Accommodation issues including fear of nursing home placement and dissatisfaction with living arrangements are also reported [7,14]. It is unclear whether the suicide rate in nursing homes is different to the general population but the main clinical features of depression and physical disability are the same [13,14]. Indirect self destructive behaviour including refusal to eat, drink, or take medications is common in nursing home residents and while most cases appear to be associated with severe dementia rather than depression with suicidal intent, there are some suicidal individuals [13].

10. Previous suicidal behaviour

Compared with younger age groups, a history of suicidal behaviour is less frequent in older persons but follow up studies of older suicide attempters have found high rates of repetition [14]. For example, a prospective, population-based self-harm cohort of 1177 older adults presenting with self-harm to six general hospitals in three cities in England found 12.8% repeated self-harm and 1.5% died by suicide within 12 months. Independent risk factors for repetition were previous self-harm, previous psychiatric treatment and age 60–74 years. The risk of suicide was 67 times that of older adults in the general population [38].

11. Psychiatric disorder

Although psychiatric disorder is prominent in late life suicide, with one review of controlled psychological autopsy studies finding that the presence of any Axis I disorder being associated with an elevated risk of suicide in older persons with significant odds ratios ranging from 27.4 to 113.1 [5], absence of psychiatric disorder appears to increase with age [39–41]. It is unclear whether this represents an accurate finding as an alternative possibility is that it reflects difficulties in identification of depression in older people.

Major depression is the main psychiatric disorder found and although many cases are recurrent episodes, first episode major depression is prominent [5,7,13,41,42]. Late onset depression may have more life events and less psychiatric comorbidity including alcohol misuse than in early onset depression [43]. Other types of depression often occur in association with comorbid chronic physical ill health, cognitive impairment and disability [7,13,14].

Although suicide risk associated with psychoses such as schizophrenia and bipolar disorder is increased in late life [44], the risk is lower than in younger adults [42]. The role of anxiety disorders, including post-traumatic stress disorder, is unclear with some studies finding an increased risk though it seems usually in the context of mixed anxiety/depressive states [5,13,45]. In one large population-based study from Denmark, the highest risk of suicide was in those hospitalised with a reaction to stress and adjustment disorder [42]. This is consistent with the observation that the increased suicide rate in older people in Hong Kong during the severe acute respiratory syndrome (SARS) epidemic was related to their stress over fears they would be a burden on their family [46]. Alcohol abuse is less frequently implicated in old age compared to younger suicides and often has comorbid depression [7,13]. Personality disorders are less common in suicidal behaviour in late life compared with younger cohorts [7,13]. There appears to be a slight increased risk associated with dementia and this mainly happens in people under the age of 70, with comorbid depression and within three months of diagnosis [42,47].

12. Strategies for suicide prevention in late life

A consensus statement from an expert panel of the International Research Group on Suicide among the Elderly noted that

evidence-based findings are scant on the prevention of suicide and suicidal behaviour in older people [48]. It recommended a range of universal (entire population), selective (high risk populations), and indicated (symptomatic individuals) strategies that could be considered. As no single prevention strategy is likely to be successful alone, a multi-faceted, multi-layered approach to suicide prevention is required. Consistent with this, an evaluation of national suicide prevention programmes in 21 OECD countries concluded that suicide rates declined after government-led suicide prevention programmes were introduced and that this was more pronounced in youth and older people [49].

A systematic review of suicide prevention programmes in late life identified 19 studies with an empirical evaluation of a suicide prevention or intervention programme [50]. The identified studies mainly addressed depression screening and treatment, and reduction of social isolation, with largely positive outcomes of reduction in suicidal ideation or suicide rates of participating communities. These studies included a series of quasi-experimental studies in rural Japanese communities with high suicide rates, which involved community-based depression screening in older people and psychoeducation with follow up of screen positives by GPs or psychiatrists, demonstrated reduced suicide rates in women but not men [51]. Recently a multimodal intervention which included involvement of local government leadership, education of the general public to reduce stigma and increase awareness, training programmes for community gatekeepers and screening and increased support for individuals at high risk, was found to be effective in reducing suicidal behaviour, particularly suicide attempts in males and older people in rural areas, but was ineffective in highly populated regions [52].

A second group of studies involved the evaluation of telephone programmes of two types [50]. The first type was designed to support older disabled people at home rather than as a suicide prevention programme, but a ten year evaluation found lower than expected suicide rates. The second type was of the more characteristic emergency suicide hotlines where evaluations did not specifically include suicidal behaviour. These results emphasise that successful interventions need not be designed specifically designed for suicide prevention.

It has long been recognised that older people have frequent contact with general practitioners (GPs) before suicide [13,14]. A third group of studies focused on the identification and management of depression and suicide risk in primary care, with two enhanced primary care studies involving collaboration with 'depression care managers' to treat late life depression showing benefits over routine care [50]. Subsequently, a clustered randomised controlled trial involving practice audit with personalised automated audit feedback and targeted printed educational material to 373 GPs and over 21 thousand patients aged 60 years or over was found to reduce the two year prevalence of depression and self harm behaviour by 10% compared with controls [53]. One important component of health professional education is the assessment and management of suicide risk, with one programme involving 132 multidisciplinary staff of two Veterans Affairs Medical Centers attending a 6.5 h workshop demonstrating improvements in the quality of case notes and recognition of suicide risk categories [54].

The management of high risk older patients with a history of recent suicidal behaviour has been a focus of evaluation in Hong Kong. The Elderly Suicide Prevention Programme (ESPP) of the Castle Peak Hospital reported on 1230 older people at high risk of suicide managed over an 8 year period. There were only eight suicides (0.65%) and all occurred within the first 6 weeks of treatment on the programme [55]. A second regional ESPP with a two-tiered multifaceted care management model of older suicide attempters compared the two-year suicide and suicide attempt outcomes with the pre-intervention observational phase of the study [56]. It found

that the ESPP was associated with a reduced rate of suicide in the suicide attempters although it did not reduce the rate of reattempts.

Universal prevention strategies that concentrate upon positive ageing, ageism, stigma, social connections and prevention of depression in late life could potentially decrease suicide risk but have yet to be tested [34]. As such, suicide prevention would not be the main focus of the strategy but rather it would be one of the potential outcomes. There is still a perception that it is 'normal' for older people to be depressed and that 'nothing can be done' about it. Two qualitative psychological autopsy studies found that suicidal older people are more likely to give warnings to relatives, but few of these warnings are passed on to health care providers and even when they are, preventive measures are not often being implemented [57,58]. From these studies efforts to improve general population knowledge of late life depression and suicide remains a key consideration for suicide prevention.

13. Conclusion

Suicidal behaviour in late life has complex aetiology and involves factors that arise from the entire lifespan. In terms of better understanding suicidal behaviour, work in recent years has made progress in identifying the neurocognitive differences between suicidal and non-suicidal depressed older people along with associated structural differences on neuroimaging. It is unclear whether these neurocognitive factors also play a role in suicidal behaviour in the absence of depression. This holds promise for future research.

There is evidence that optimal management of depression and of high risk individuals can be effective in reducing depressive symptoms and suicidal behaviour. How best to improve the quality of depression management in primary and secondary care requires further research. Further work is also required to examine if enhancement of social connections is beneficial. Currently the Senior Connection, a randomised trial of volunteer peer companionship for older people involving community-based social services agencies and primary care practises, is underway in the United States [59]. Effective suicide prevention in a population, however, is likely to require a multi-layered multi-faceted approach. Further research is required regarding the optimal way of delivering such interventions particularly in urban populations and for males.

Contributors

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Competing interest

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