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Combined Botulinum Toxin Injections and Phenol Nerve / Motor Point Blocks to Manage Multifocal Spasticity in Adults

Fahim Anwar & Shruthikaa Ramanathan

Abstract

Objectives: To highlight the importance of combining phenol and botulinum toxin in the treatment of spasticity in adult patients resulting from upper motor neuron lesion. **Design:** A retrospective case series. **Setting:** A tertiary care hospital. **Participants:** Patients in spasticity clinic. **Intervention:** 29 patients with spasticity resulting from various neurological conditions underwent combined botulinum toxin and phenol nerve block to manage spasticity. **Results:** The most frequently used combination was obturator nerve block with botulinum toxin to hamstring muscles (34.4%). The combination of a posterior tibial nerve block with hamstring botulinum toxins was used in 3 (10.3%) patients. There were no adverse events from both phenol and botulinum toxins. **Conclusions:** The combination of botulinum toxin and phenol nerve/motor point blocks allowed many muscles to be injected, during one clinic attendance, to manage spasticity in adults with neurological conditions.

Keywords: Phenol, botulinum toxin, spasticity, nerve blocks, motor point blocks

Abbreviations: INR - International Normalised Ratio

Introduction

Spasticity was first described by Lance¹ in 1980, and according to him it was described as; a motor disorder characterised by a velocity-dependent increase in tonic stretch reflexes (muscle tone) with exaggerated tendon jerks, resulting from hyperexcitability of the stretch reflex, as one component of the upper motor neuron syndrome. Spasticity can be a consequence of many neurological conditions including traumatic brain injury, spinal cord injury, stroke and multiple sclerosis. The annual incidence of spasticity in the lower limb following a stroke, traumatic brain injury and spinal cord injury is estimated to be 30 to 485 per 100,000, 100-235 per 100,000 and 0.2 to 8 per 100,000 respectively². Spasticity is characterised by muscle overactivity and can lead to permanent changes in the muscle fibres leading to muscle contractures. Contractures can be very painful and may interfere with seating, posture, mobility and activities of daily living, thus increasing the care cost significantly.

Phenol has been used peripherally and intrathecally for the treatment of spasticity for many years. The botulinum toxin became available in the last decade for treatment of spasticity. Its use has increased since then, and this has led to a decline in the use of phenol. It is still being used in patients who are sensitive to botulinum toxins or have developed antibodies to them. Phenol is both neurolytic and anaesthetic in nature³. The anaesthetic effect of phenol can be seen immediately after the injection where the patient reports an immediate effect. The

neurolytic effect takes at least two weeks, and therefore patients should be educated not to expect any significant change in the spasticity before two to four weeks. Phenol can also be used in combination with botulinum toxin to treat multifocal spasticity where the maximum dose of botulinum exceeds the recommended safe dose. This allows several groups of muscles to be treated in a single setting³.

The lethal dosage of phenol has been reported to be greater than eight grams⁴. Phenol in aqueous solution is preferred for peripheral nerve and motor point blocks and is available in 5, 6 and 7% concentration. Injecting botulinum toxins is quite different from performing nerve and motor point blocks. Phenol nerve and motor point blocks take a longer duration of time to perform as compared to botulinum toxins. For motor point blocks, a nerve stimulator with a surface electrode is needed to localise the motor points on the muscles. In the present study, we highlight the importance of management of spasticity in adults with a combination of botulinum toxin and phenol nerve /motor point blocks. A case series of patients who underwent combined phenol and botulinum toxin is presented, describing the diagnosis, number and location of muscles injected, types of phenol nerve and motor point blocks and any complications encountered.

Methods

This is a retrospective study conducted at the Rehabilitation Medicine Department of the University Hospital in Cambridge

UK. The study period included from December 2014 to January 2017. The patients were identified from the spasticity clinic database. All patients were assessed in the spasticity clinic, and a plan to inject the botulinum toxin along with phenol nerve block/motor point block agreed with the patient. The patients who decided to have the procedure were appointed to a clinic to perform the agreed injections and blocks. If the patients were on anticoagulants (warfarin, dalteparin or clopidogrel), they were advised to stop the anticoagulation 3 days before the procedure. International Normalised Ratio (INR) was checked before the procedure. The usual dose of anticoagulation was started after the procedure.

Patients were consented and placed on a plinth. Botulinum toxin type A only was used in our study. It was diluted with normal saline, and the muscles were injected either using the surface anatomy or electrical stimulation. Each muscle was either injected at one to two sites, depending on the size of the individual muscle.

Phenol nerve blocks and motor point blocks were performed according to the techniques described by Roy³ and Gaid⁵. Aqueous phenol 5% (phenol in water) was used for all the procedures. The nerves were identified using a nerve stimulator with a surface electrode using 2mA current (Figure 1). The skin was infiltrated with 1% lignocaine, and the nerve was approached with a stimulator needle. The nerve was then ablated with 5% phenol under stimulation guidance. The dose of the phenol was titrated while the nerve was being stimulated. The motor points were located similarly with the help of a surface electrode and marked before ablation with 1 to 2 ml of 5% phenol. The amount of botulinum toxin and phenol was recorded. All patients were reviewed in 6 weeks' time for any complications.

Figure 1: Nerve Stimulator with surface electrode

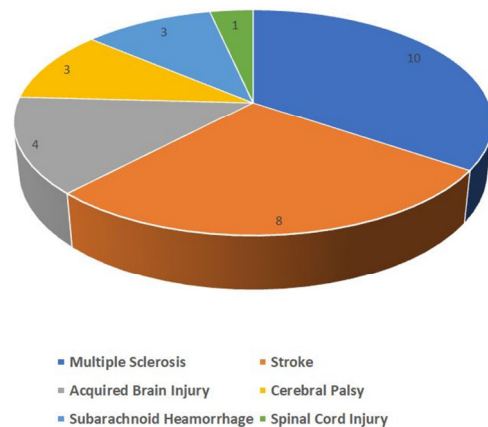


Results

Between December 2014 to January 2017, we treated 29 patients with spasticity caused by different neurological conditions with a combination of aqueous phenol and botulinum toxin injections. There were 15 males and 14

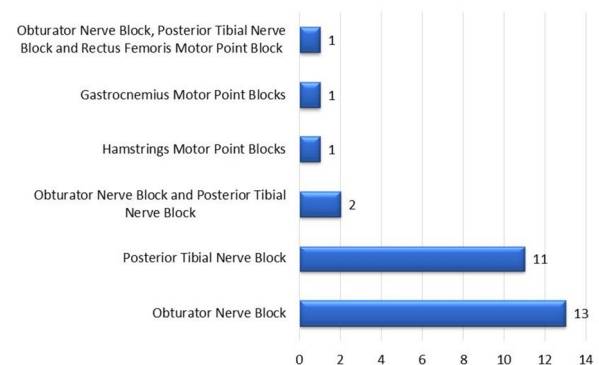
females with an age range of 18 to 80 years and a mean age of 49.3 years. The most common diagnosis was multiple sclerosis followed by stroke (Figure 2). A total of 40 phenol nerve or motor point blocks were performed in 29 patients. Nineteen patients (65.5%) received phenol blocks once, 9 (31%) twice and only 1 patient (3.4%) had the phenol block done three times. Where the phenol blocks were repeated, the mean duration between the phenol injection was 14.1 months (range 6-23 months). The procedure was bilateral in 16 (55.2%) and unilateral in 13 (44.8%). The local anaesthetic (trial block) was performed in 6 (20.6%) patients who were ambulatory before the phenol block.

Figure 2: Frequency of Diagnosis



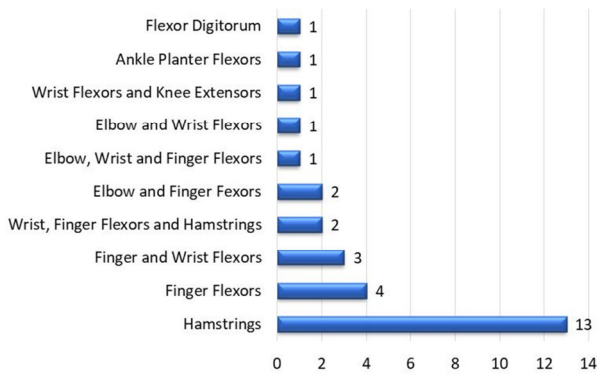
Obturator nerve block was the most common phenol procedure performed (44.8%), followed by posterior tibial nerve block (37.9%). Two (6.9%) patients had both obturator nerve blocks and posterior tibial nerve blocks, whereas 1 (3.4%) patient had hamstring motor point blocks, 1 (3.4%) patient had gastrocnemius motor point blocks. One patient (3.4%) had bilateral obturator nerve blocks, posterior tibial nerve blocks and rectus femoris motor point blocks (Figure 3).

Figure 3: Frequency of Phenol Nerve/Motor Point Blocks



Botulinum toxin was also injected into various muscles in all 29 patients. The botulinum was repeated every 4 to 6 months in the same muscles. Botulinum toxins were injected bilaterally in 12 (41.4%) and unilaterally in 17 (63.6%) patients. The most common muscles injected with botulinum toxin were hamstrings (44.8%) followed by finger flexors (13.8%). The frequency of botulinum toxins injections is shown in Figure 4.

Figure 4: Muscles Injected with Botulinum Toxins



The most common combination in our series was obturator nerve block and hamstring botulinum toxin injections (34.4%). The combination of posterior tibial nerve block with hamstring botulinum toxins was used in 3 (10.3%), and 2 (6.8%) patients received posterior tibial nerve block with finger flexor botulinum toxin injections. The combination of phenol and

botulinum toxin injection is shown in Table 1. There were no complications noted following both phenol as well as botulinum toxin injections.

Discussion

Perineural injection of aqueous phenol (3 to 7%) can reduce spasticity by blocking the nerve signals to the group of muscles supplied by the nerve. Phenol produces an initial local anaesthetic effect which is followed by neurolysis caused by protein coagulation and inflammation⁶. The neurolysis leaves the nerve with about 25% less function than before but does not disadvantage people with little or no residual function, as a mild progressive denervation can be beneficial in reducing spasticity⁶. Khalili et al⁷ first described the technique of phenol nerve blocks and also suggested that the re-growth of most axons is seen with preservation of gamma motor neurons. This means that phenol reduces spasticity without reducing the strength of the muscle significantly.

Table 1: Combination of Phenol and Botulinum Toxins used

		Phenol Nerve/Motor Point Blocks					
		Obturator Nerve Block	Posterior Tibial Nerve Block	Obturator and Posterior Tibial Nerve Block	Hamstrings Motor Point Blocks	Gastrocnemius Motor Point Blocks	Obturator, Posterior Tibial Nerve Block and Rectus Femoris Motor Point Block
Muscles Injected with Botulinum	Hamstrings	10	3	0	0	0	0
	Finger Flexors	0	2	1	0	0	0
	Finger and Wrist Flexors	0	2	0	1	0	0
	Wrist, Finger Flexors and Hamstrings	1	0	1	0	0	0
	Elbow and Finger Flexors	0	1	0	0	1	0
	Elbow, Wrist and Finger Flexors	0	1	0	0	0	0
	Elbow and Wrist Flexors	0	1	0	0	0	0
	Wrist Flexors and Knee Extensors	1	0	0	0	0	0
	Ankle Planter Flexors	1	0	0	0	0	0
	Flexor Digitorum	0	1	0	0	0	0

The use of combining phenol with botulinum toxins injections has been documented in children with cerebral palsy and central nervous degenerative diseases⁸. To date, there are no studies in the literature showing the use of combined phenol and botulinum toxins in the treatment of spasticity in adults. The combination of phenol with botulinum toxin helps to treat multifocal spasticity allowing more spastic areas to be treated. The most frequent pattern used in Gooch et al⁸ study was obturator nerve block and gastrocnemius botulinum toxin injections. In our study, the most common combination was obturator nerve block and hamstring botulinum toxin injections. The possible explanation for this variance is that the

majority of our study population suffered from multiple sclerosis and hamstring with hip adductor spasticity is a very common pattern.

The mechanism of action of phenol is different from botulinum toxins. However, the reduction in spasticity with phenol and botulinum toxins is comparable. Manca et al⁹ compared botulinum toxins and phenol nerve blocks to reduce ankle clonus in spastic paresis and concluded that both patient groups showed significant clonus reduction over time with the phenol group effect greater than the botulinum toxins group. They also suggested that the two drugs have a different mechanism of

action with phenol reducing the excitability of the alpha motor neuron. A randomised double-blind trial by Kirazli et al¹⁰ compared the effects of botulinum toxins Type A and phenol on post-stroke ankle plantar flexor and invertor spasticity. There was a significant change in Ashworth scores at week 2 and 4 in the group who received botulinum toxins but there was no significant difference between the two groups at week 8 and 12¹⁰. Similarly, the decrease in clonus duration (detected by electromyography) was significant in both groups. However, the group that received botulinum toxins showed significant change at week 2 and 4 compared to phenol group. The reason for this may be the delayed onset of action of phenol as compared to botulinum toxins. Burkel et al⁶ studied the effects of phenol into the peripheral nerves of rats and showed that Wallerian degeneration of the nerves occurs before healing by fibrosis that starts after about 4-6 months following phenol injections. Their study also concluded that following phenol the nerves are left with 25% less function than before and this does not disadvantage the people with little or no residual function⁶.

There is always a risk of deteriorating the mobility or function due to weakness caused by the phenol nerve block. It is our usual practice to perform a local anaesthetic block (trial block) before injecting the phenol in all ambulatory patients or patients who are using spasticity functionally to their advantage. In our series, 20.6% of patients underwent local anaesthetic block before proceeding to the phenol block. There were no adverse effects noted following the local anaesthetic block, and all six patients chose to have the phenol blocks. A recent study by McCrea et al¹¹ looked at the effects of phenol on position and velocity components of spasticity in addition to strength in post-stroke elbow flexor spasticity. The study concluded that phenol paradoxically improved muscle strength in addition to reducing hypertonia¹¹.

In our series, we used phenol mainly for lower limb muscles and botulinum toxins for both the lower and upper limb muscles. For smaller muscles of the upper limb, it is difficult, but not impossible, to find the motor points. The technique for upper limb phenol blocks has been well described in literature³. However, when combining the botulinum toxins with phenol, we find it useful to prefer the phenol block for the lower limb muscles. Gooch et al⁸ also injected larger proximal muscles with phenol, and smaller distal and deeper muscles with botulinum toxins. In our series, the maximum dose of botulinum toxins used was 1000 units of Dysport and the maximum dose of phenol used was 20 ml of 5% aqueous phenol.

Conclusion

The combination of botulinum toxin with phenol injections is effective in treating multi-focal spasticity in clinical settings.

The advantage of using phenol in combination with botulinum toxins is cost-reduction and the flexibility of managing various muscle groups at the same time. Further studies are needed to evaluate the long-term cost-effectiveness and complications of combining phenol and botulinum toxins, especially after repeated injections.

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NONE

Competing Interests

None declared

Author Details

FAHIM ANWAR, MBBS, MRCS, FRCP, FEBPRM,
Cambridge University Hospital Nhs Foundation Trust
SHRUTHIKAA RAMANATHAN, MBBS, MRCP,
Cambridge University Hospital Nhs Foundation Trust
CORRESPONDENCE: FAHIM ANWAR, Box 248,
Addenbrooke's Hospital, Cambridge, United Kingdom
Email: fanwar@nhs.net

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Depression in older adults

Claire Pocklington

Abstract

Despite being the most common mental disorder in older adults, depression is under-recognised. It poses diagnostic difficulties in this population for several reasons; for example, symptomatic and phenomenological differences, age-related biological and psychological factors, and the presence of physical comorbidities. Depression in older adults is an important clinical topic because outcomes are worse in comparison to younger adults. It is also associated with higher rates of morbidity and mortality, increased healthcare utilisation and economic costs. It is likely to become a more pressing issue in the future due to the projected increase in the older adult population. This article explores the topic of depression in older adults.

Introduction

Depression is a clinical syndrome. The International Classification of Diseases (ICD) diagnostic classification systems describe three core symptoms of depression; low mood, anhedonia and reduced energy levels¹. Other symptoms include impaired concentration, loss of confidence, suicidal ideation, disturbances in sleep and changes in appetite. Symptoms must have been present for at least a period of two weeks for a diagnosis of depression to be made. Major depression refers to the presence of all three core symptoms and, in accordance with ICD criteria, at least the presence of a further five other symptoms¹. See Table 1 for severity criteria of a depressive episode according to ICD criteria.

Depressive symptoms, which can be clinically significant, can be present in the absence of a major depressive episode. Depressive symptoms are those that do not fulfil diagnostic criteria for a diagnosis of depression to be made. Depressive symptoms can be collectively referred to as sub-threshold depression, sub-syndromal depression or minor depression².

It has been proposed that there are two types of depression; early-onset and late-onset depression. Late-onset depression refers to a new diagnosis in individuals aged 65 years of age or older. Over half of all cases of depression in older adults are newly arising (i.e. the individual has never experienced depression before) and thus late-onset type depression. Late-onset type depression is associated more with structural brain changes, vascular risk factors and cognitive deficits. It has been suggested that late-onset depression could be prodromal to dementia³.

The Kings Fund has estimated that by 2032 the proportion of older adults aged 65-84 years old will have increased by 39% whereas the proportion over the age of 85 years will have increased by 106%⁴. This increase in population will

consequently see the incidence and prevalence of depression rise. By 2020 it is estimated that depression will be the second leading cause of disability in the world regardless of age⁵. Recognising, and so diagnosing, depression in older adults will become more important because of a greater demand on existing healthcare services and provisions, due to physical health consequences, impact upon healthcare utilisation and greater economic healthcare costs.

Table 1: Severity criteria of a depressive episode according to ICD-10¹

Criteria A – General:	Criteria B – Presence of ≥2 of the following:	Criteria C – ‘Other’ symptoms:
Symptoms for at least 2 weeks Symptoms not attributable to psychoactive substance use or organic mental disorder	Low mood Anhedonia Reduced energy levels/ increased fatigability	Loss of confidence and self-esteem Feelings of guilt Suicidal thoughts Impaired concentration/ability to think Changes in psychomotor activity Sleep disturbance Changes in appetite with weight changes
Criteria for severity of depressive episode:		
Mild episode: 2 symptoms of criteria B	Moderate episode: ≥2 symptoms of criteria B + symptoms of criteria C until minimum of 6 symptoms in total	Major episode: all 3 symptoms of criteria B + symptoms of criteria C until a minimum of 8 symptoms in total

Presentation of depression in older adults

The presentation of depression in older adults is markedly different to that in younger adults. The most significant and

fundamental difference in presentation in older adults is that depression can be present with the absence of an affect component, i.e. subjective feelings of low mood or sadness are not experienced^{3,6-9}. The absence of an affective component is referred to as 'depression without sadness'⁸⁻⁹. It is common instead for older adults to report a lack of feeling or emotion when depressed⁸⁻⁹.

Anhedonia is also less prevalent in this population. However, reduced energy levels and fatigue are frequently reported⁸⁻⁹.

Compared to younger adults, psychological symptoms of depression occur more frequently and are more prevalent in older adults¹⁰. Such psychological symptoms include feelings of guilt, poor motivation, low interest levels, anxiety related symptoms and suicidal ideation. The presence of irritability and agitation are key features as well⁷. Hallucinations and delusions are also more common in older adults, particularly nihilistic delusions (i.e. a person believing their body is dead or a part of their body is not working properly or rotting).

Cognitive deficits are characteristic of depression in older adults^{7,11} and are described as 'substantial and disabling'¹². Such deficits mainly concern executive function¹³⁻¹⁴. Pseudodementia is a phenomenon seen in older adults¹⁵. The term refers to cognitive impairment secondary to a psychiatric condition, most commonly depression¹⁶. Pseudodementia has become synonymous with depression. Pseudodementia can be mistaken for an organic dementia and so older adults who are depressed can present primarily to mental health services with memory problems. Pseudodementia is classically associated with 'don't know' answers, whereas older adults with a true dementia will often respond with incorrect answers¹⁷.

'Depression-executive dysfunction syndrome' is a more specific and descriptive term to describe the cognitive deficits found in older adults with depression¹⁴. It is associated with psychomotor retardation, which can be a core feature of depression in this population^{7,14,18}. Psychomotor retardation describes a slowing of movement and mental activity¹⁹. Like pure cognitive deficits, psychomotor retardation contributes significantly to functional impairment¹⁹. Both executive dysfunction and psychomotor retardation have been found to be related to underlying structural changes in the frontal lobes^{14, 20-21}. Psychomotor retardation is further related to white matter changes in the motor system, which leads to impaired motor planning²¹. There is conflicting evidence of whether the presence of psychomotor retardation is related to depression severity¹⁸⁻¹⁹.

Somatisation and hypochondriasis are associated with depression in older adults and increasing age in general²²⁻²³. Somatisation is often overlooked in older adults by healthcare professional who actively search to attribute such symptoms to a physical cause. Somatisation is more common in those who have physical comorbidities. Somatisation in older adults is associated with structural brain changes and cognitive deficits²⁴.

Depression in older adults is associated with functional impairment cognitively, physically and socially^{7,12,25}. Such functional impairment is linked to loss of independent function and increased rates of disability²⁶. Withdrawal from normal social and leisure activities can be marked^{7,25}. Social avoidance reduces interaction with others and is often a maintaining factor for depression²⁵.

Self-neglect is a classical feature of depression⁷, with the presence of depressive symptoms in older adults being predictive of it²⁷. Behavioural disturbances can be a common mode of presentation, especially for older adults living in institutionalised care⁶⁻⁷. Behavioural disturbances include incontinence, food refusal, screaming, falling and violence towards others⁷.

Diagnostic difficulties

Depression in older adults has been a condition that has constantly been under-recognised. Several issues account for this. Firstly, phenomenological differences are present. Many have argued that phenomenological issues contribute heavily to diagnostic difficulties²⁸; both the DSM and ICD classification systems do not have specific diagnostic criteria for depression in older adults. Potentially invalid diagnostic criteria for depression in older adults could result in fundamental difficulties in understanding, with consequent impact on both clinical practice and research.

Diagnostic difficulties are also encountered because depression in older adults can present with vague symptoms, which do not correspond to the classical triad of low mood, low energy levels and anhedonia, which can all be cardinal symptoms in a younger population. Reports of fatigue, poor sleep and reduced appetite can be attributed to a host of causes other than depression and therefore it is no surprise that a diagnosis of depression is overlooked and goes undetected by healthcare professionals²⁹.

The absence of an affective component (i.e. low mood) can lead to healthcare professionals disregarding the potential for the presence of depression and consequently not exploring for other symptoms.

Furthermore, symptoms of depression, especially somatic ones, are often attributed to physical illnesses. Depressive somatic symptoms often lead to a diagnosis of depression being overlooked; such symptoms 'mask' the clinical diagnosis of depression and hence the term 'masked depression'³⁰. Depressive somatic symptoms – e.g. low energy levels, insomnia, poor appetite and weight loss – are often attributed to physical illness and/or frailty by both the individual and healthcare professional^{7-8, 31}.

Further complicating diagnostic difficulties and under-recognition is the fact that older adults are less likely to report any symptoms associated with mental health problems and ask for help in the first place^{7,10,32}; explanations for this include older adults being less emotionally open, having a sense of being

a burden or nuisance, and believing symptoms are a normal part of ageing or secondary to physical illness^{7,10,29,33}. Older adults also have a reluctance to report mental health problems due to their perception of associated stigma; many older adults hold the view the mental health problems are shameful, represents personal failure and leads to a loss of autonomy⁷.

There is an overlap between symptoms of depression and symptoms of dementia. It is quite common for older adults with dementia to initially present with depressive symptoms. Depression has a high incidence in those with dementia, especially those with vascular dementia. Depression is particularly difficult to diagnose in dementia due to communication difficulties; diagnosis is often based on observed behaviours^{8,33}.

Depression and comorbidity in older adults

In those with pre-existing physical health problems, depression is associated with deterioration, impaired recovery and overall worse outcomes³⁴. For example, the relative risk of increased morbidity related to coronary heart disease is 3.3 in comparison to individuals without depression³⁵. Mykletun et al. established that a diagnosis of depression in older adults increased mortality by 70%³⁶. Several causative routes account for poor physical illness outcomes. Older adults with depression are less likely to report worsening health. Depressive symptomatology indirectly affects physical illness through reduced motivation (often secondary to feelings of helplessness and hopelessness) and engagement with management. Poor compliance with management advice, notably adherence to medications is observed³⁷. Feelings of hopelessness, helplessness and negativity will contribute to the failure to seek medical attention in the first place or report worsening health when seen by a healthcare professional.

Depression affects biological pathways directly, which impairs physical recovery. Such biological effects include pro-inflammatory factors, metabolic factors, impact upon the hypothalamic-pituitary axis and autonomic nervous system changes³⁸.

Older adults who are depressed are more likely to have existing physical health conditions and more likely to develop physical health conditions¹⁵. Depression is particularly associated with specific physical illnesses; cardiovascular disease and diabetes mellitus. A study by Win *et al.* found that cardiovascular mortality is higher in older adults with depression because of physical inactivity; the study established that physical inactivity was accountable for a 25% increased risk in cardiovascular disease³⁹. The relationships between depression and cardiovascular disease and depression and diabetes have been described as “bidirectional”³⁸.

Higher incidents of cardiovascular disease and diabetes mellitus are seen in people with depression regardless of age. A study by Brown et al. found that older adults with depression had a 1.46 relative risk increase for developing coronary heart disease

compared to those without depression⁴⁰. The hypothalamic-pituitary axis dysfunction found in depression leads to increased levels of cortisol, which in turn, increases visceral fat. Increased visceral fat is associated with increased insulin resistance, promoting diabetes mellitus, and increased cardiovascular pathology³⁸.

Depression is a risk factor for the subsequent development of dementia; this is especially so if an older adult has no previous history of depression (i.e. depression is late-onset)¹³.

Healthcare utilisation and economic impacts

Older adults are less likely to report depressive symptoms to healthcare professionals explaining the under-utilisation of mental health services for depression^{32,41}. Despite older adults under-utilising mental health services they over utilise other healthcare services^{26,41}. For example, those presenting with non-specific medical complaints or somatisation have been found to have an increase use of healthcare services. Non-specific medical complaints and somatisation lead to an unnecessary use of resources, such as unnecessary consultations with healthcare professionals and investigations⁴¹. Increase in service utilisation means an increase in the associated economic cost of depression in older adults⁴¹⁻⁴³.

Healthcare costs of older adults with a comorbid physical illness and depression are far greater than those without depression – findings in diabetes mellitus are a good example⁴³. The majority of the increased healthcare costs are associated with the chronic physical disease and not the care and treatment of the depression⁴⁴. Poor compliance with physical illness management is associated with missed appointments and a greater number of hospital admissions, which both have financial implications.

Aetiology and associations of depression in older adults

Late-onset type depression in older adults has been associated with the term ‘vascular depression’⁴⁵⁻⁴⁷. Studies have found a significant higher rate and severity of white matter hyperintensities on MRI imaging in older adults with depression compared to those without depression^{46,48,50}. White matter hyperintensities represent damage to the nerve cells; such damage is a result of hypo-perfusion of the cells secondary to small blood vessel damage⁴⁹. White hyperintensities are associated with vascular risk factors (e.g. age, hypertension, hypercholesterolemia, obesity, diabetes mellitus, smoking) and are linked to cerebrovascular disease, such as stroke, vascular dementia. A relationship has been found between psychosocial stress and consequent development of vascular risk factors, which further supports the hypothesis of ‘vascular depression’⁴⁶. Clinically, ‘depression-executive dysfunction syndrome’ and psychomotor retardation are associated with vascular changes⁴⁸.

In older adults with depression, white matter hyperintensities are associated with structural changes to corticostriatal circuits and subsequent executive functional deficits. Loss of motivation or interest and cognitive impairment in depression are hallmark

features of structural brain changes associated with the frontal lobes, which in turn are associated with a vascular pathology²⁰. A study by Hickie et al. established that white matter hyperintensities in older adults with depression are associated with greater neurological impairment and poorer response to antidepressant treatment⁵⁰. It is not fully understood why vascular depression responds less well to antidepressants; poor response has been linked directly to vascular factors but has also been associated with deficits in executive function⁴⁶⁻⁴⁷.

The relationship between cerebrovascular disease and depression is described as 'bi-directional'^{45,51}; depression has been found to cause cardiovascular disease and vice versa⁵¹. Baldwin et al. direct the reader to the presence of post-stroke depression and the occurrence of depression in vascular dementia⁴⁵.

Younger and older adults share a number of fundamental risk factors for depression; such as female gender, personal history and family history⁷. Older adults have additional risk factors related to ageing, which are not just physiological in nature.

Age related changes:

Age related changes occurring in the endocrine, cardiovascular, neurological, inflammatory and immune systems have been directly linked to depression in older adults³.

The normal ageing process sees changes to sleep architecture and circadian rhythms with resultant changes to sleep patterns⁵². Thus sleep disturbances are common in older adults and positively correlated to advancing age⁵²; over a quarter of adults over the age of 80 years report insomnia, and research has well-established that this is a risk factor for depression⁵³⁻⁵⁴. A meta-analysis by Cole *et al.* found sleep disturbances to be a significant risk factor for the development of depression in older adults⁵³.

Sensory impairment:

Sensory impairments, whether secondary to the ageing or a disease process, are risk factors^{53,55}. Research has found that hearing and vision impairments are linked to depression⁵⁶. A sensory impairment can lead to social isolation and withdrawal, which, in turn, are further risk factors for depression.

Physical illness:

Physical illness, regardless of age, is a risk factor for depression. Older adults are more likely to have physical illnesses and so in turn are more at risk of depression. See Table 2. Physical illness is associated with sensory impairments, reduced mobility, impairment in activities of daily living and impaired social function, all of which can lead to depression. Physical illnesses associated with chronicity, pain and disability pose the greatest risk for the subsequent development of depression^{7,53,55}. Physical illness affecting particular systems of the body, such as the cardiovascular, cerebrovascular and neurological, are more likely to cause depression³. Essentially, however, any serious or chronic illness can lead to the development of depression. It

should be noted that a large proportion of older adults have physical illness but do not experience depression symptoms, therefore other factors must be at play^{5,57}.

Treatments of physical illness are directly linked to aetiology in depression, for example, certain medications are known to cause depression; cardiovascular drugs (e.g. Propranolol, thiazide diuretics), anti-Parkinson drugs (e.g. levodopa), anti-inflammatories (e.g. NSAIDs), antibiotics (e.g. Penicillin, Nitrofurantoin), stimulants (e.g. caffeine, cocaine, amphetamines), antipsychotics (e.g. Haloperidol), anti-anxiolytics (e.g. benzodiazepines), hormones (e.g. corticosteroids), and anticonvulsants (e.g. Phenytoin, Carbamazepine)^{7,29}. Polypharmacy is present in many older adults further increasing the risk of depression. Pharmacokinetic and pharmacodynamic age related changes also contribute to an increased risk of medication induced depression in older adults.

Table 2: Table of physical illnesses associated with depression^{3,7}

Cardiovascular	Endocrine	Cerebrovascular/neurological
Ischaemic heart disease Myocardial infarction	Addison's disease Cushing's disease Hypothyroidism Hyperthyroidism Diabetes mellitus Hypoglycaemia	Cerebral arteriosclerosis Cerebral infarction Intracranial tumour Parkinson's disease Multiple sclerosis Temporal lobe epilepsy Dementia
Metabolic	Autoimmune disorders	
Electrolyte abnormalities • Hypernatraemia • Hypercalcaemia • Hyperkalaemia • Hypokalaemia Folate deficiency Thiamine deficiency	Rheumatoid arthritis Systemic lupus erythematosus Pernious anaemia	

Dementia:

Dementia is common in old age and those with dementia are at higher risk of developing depression compared to those who do not have it⁵⁸. 20-30% of older adults with Alzheimer's disease have depression⁵⁹. Depression is a risk factor for the subsequent onset of dementia.

Psychosocial:

When compared to younger adults, older adults are at a greater risk of developing depression due to the increased likelihood of experiencing particular psychosocial stressors, in particular adverse life events. Stressors include lack of social support, social isolation, loneliness and financial hardship. Financial hardship and functional impairment often sees older adults downsizing in property. Deteriorating physical health often sees older adults no longer being able to manage living independently at home necessitating a move into institutional living. Bereavement, especially spousal, and the associated role change that follows this are risk factors for depression³.

Sub-threshold depression:

Sub-threshold depression is an established risk factor for major depression.

Prevalence and epidemiology

The prevalence of depression in older adults in England and Wales was found to be 8.7% in 2007; however, if those with dementia are included this figure rises to 9.7%⁶⁰. A meta-analysis by Luppá et al. established a 7.2% point prevalence of major depression and a 17.1% point prevalence of depressive disorder in older adults⁶¹. The projected lifetime risk of an older adult developing major depression by the age of 75 years old is 23%⁶².

Sub-threshold depression is 2-3 times more prevalent than major depression in older adults^{26,63}. These depressive symptoms are often clinically relevant^{26,29}. 8-10% of older adults per year with sub-threshold depressive symptoms go onto develop a major depressive episode⁶³.

Incidence and prevalence are greater in women; 10.4% of women over the age of 65 years have depression compared to 6.5% of men⁶⁰. Older women are more likely to experience recurrent episodes of depression compared to older men⁶². The gender gap in incidence and prevalence becomes narrower with increasing age³. It should be acknowledged however that women are more likely to present to healthcare services and seek help in comparison to men⁶⁴⁻⁶⁵.

The prevalence of major depression in older adults varies by setting⁶⁶. Highest rates are seen in long-term institutional care and inpatient hospital settings⁶⁷. Table 3 summaries prevalence rates of major depression by setting.

Table 3: Prevalence rate of major depression by setting^{7, 67}

Setting	Prevalence rate (%)
Community	5 – 10
Primary care	10 – 30
Hospital inpatient	11 – 50
Long-term institutional care	10 – 43

Prognosis of depression in older adults

Depression in older adults is associated with a slower rate of recovery⁹, worse clinical outcomes compared to younger adults³ and is associated with higher relapse rates⁶⁸. Worse prognosis in older adults correlates with advancing age, physical comorbidities and functional impairment⁷⁰. The structural brain changes associated with depression in older adults are linked, as discussed, to poorer treatment response.

Morbidity and mortality associated with depression can be described as primary or secondary; primary morbidity and mortality arises directly from the depressive illness; whereas secondary morbidity and mortality arises from physical health problems, which are secondary to depression.

Outcomes from sub-threshold depression are on par with those of major depression; however sub-threshold depression which develops into major depression is associated with worse outcomes².

Proportionally more people over the age of 65 years commit suicide compared to younger people⁷¹. Depression is the leading cause of suicide in older adults^{29,71}; one study reports that 75% of older adults who killed themselves were depressed⁷².

The vast majority of older adults who commit suicide have had contact with a health professional within the preceding month⁹; this figure has been quoted as high as 70%³. This further supports and suggests the fact the depression is under-detected. Unlike younger adults, older adults are less likely to report suicidal ideation and can experience suicidal ideation without feeling low in mood^{3,7}. Older adults have few suicide attempts, compared to younger adults, because their suicide methods are more lethal¹³.

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Competing Interests

None declared

Author Details

CLAIRE POCKLINGTON, MBChB MSc MRCPsych, ST5 Old Age Psychiatry, South West Yorkshire Partnership NHS Foundation Trust, Drury Lane Health and Wellbeing Centre, Wakefield, WF1 2TF, UK.

CORRESPONDENCE: CLAIRE POCKLINGTON, Drury Lane Health and Wellbeing Centre, Drury Lane, Wakefield WF1 2TF.

Email: pocklington.c@gmail.com

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Timely intervention and effective multidisciplinary input for a woman with multi-organ failure secondary to cardiac arrest due to ruptured ectopic pregnancy

Sucheta Jindal & M Mweemba

Abstract

The clinical presentation of ectopic pregnancy is extremely variable ranging from asymptomatic to haemorrhagic shock. Unforeseen tubal rupture can be a source of substantial morbidity and mortality. There has been a worldwide decrease in the case fatality rate in women with ectopic pregnancies, suggesting it is largely due to the early detection and prompt management of ectopic pregnancies.

Here we report a case of a ruptured ectopic pregnancy of a 27-year-old woman who was unaware of her pregnancy and presented with cardiac arrest followed by multi-organ failure but showed a miraculous recovery after 72 hours, all visceral functions returning to normal within 7 days.

This case report gives insight to all medical specialities, the importance of active multi-disciplinary resuscitation measures. This will also help the medical students as part of their problem based learning to understand the basic sciences behind sharp decline and remarkable recovery in life threatening emergencies.

Précis

The significance of effective communication within multidisciplinary teams especially in emergency situations towards optimising patient care and saving lives cannot be understated.

Case Report

A 27-year-old woman who claimed to be unaware of her current pregnancy collapsed at her home. She was not known to have any co-morbidities. Paramedics were called and found her to be in cardiac arrest with pulseless electrical activity. Cardiopulmonary resuscitation (CPR) was immediately commenced. Spontaneous circulation returned after 13 minutes of CPR at home.

She was then transferred to the emergency department. On arrival to the emergency department her Glasgow Coma Scale (GCS) was 3. She had a pulse rate of 130 beats per minute; unrecordable blood pressure; haemoglobin of 55g/l; metabolic acidosis with a pH of 6.8; lactate > 15; and a potassium of 6.6 mmol/l. She was resuscitated and gradually regained consciousness with a GCS of 15.

In the midst of stabilising her condition and unaware of her pregnancy, a urine pregnancy test was obtained following siting of a urinary catheter. A positive pregnancy test prompted notification to the gynaecology team who performed ultrasonography imaging which revealed significant haemoperitoneum. An immediate decision was made to perform laparotomy in view of the most likely diagnosis of a ruptured ectopic pregnancy.

Laparotomy revealed a 3.5 litre of haemoperitoneum secondary to a ruptured right sided tubal ectopic pregnancy. A right salpingectomy was performed. The patient was subsequently transferred to the intensive care unit as her serology results were consistent with multi organ failure with a platelet count of 46 ($10^9/L$); creatinine of 194 mmol/L; estimated glomerular filtration rate (egfr) of 27 mls/min/ 1.73 m²; alanine transaminase (ALT) of 441 IU/L; and alkaline phosphatase (ALP) of 49 IU/L.

She made an uneventful recovery as demonstrated in figure 1 by the improving serological parameters and was discharged home after 6 days.

Discussion

The confidential enquiry report into maternal deaths – UK has shown a decreasing trend in the case fatality rate in women with ectopic pregnancies. This has been suggested to reflect earlier detection and immediate treatment of ectopic pregnancies. However unforeseen tubal rupture with major haemorrhage continues to be a source of major morbidity and mortality. Ectopic pregnancies account for 3-4% of pregnancy related deaths.⁴

The classical triad of symptoms encountered in ectopic pregnancy includes pain, vaginal bleeding and amenorrhoea.¹Worryingly, as illustrated by our case, rarely these women may present in a state of collapse even before the diagnosis of pregnancy is made.⁴

Figure 1: The cumulative serology- full blood count, liver function tests, urea and electrolytes, clotting profile.ankle

Investigations	Day 0	Day 0	Day 1	Day 1	Day 2	Day 3	Day 4	Day 5	Day 15
	13:46	18:30	05:53	17:27	06:49	07:00	11:14	09:37	09:50
Hb g/L (115-150)	82	100	83	73	72	88	89	93	
WCC 10 ⁹ /L (3.5-11.0)	19.8	23	18.1	13.2	11.8	11.2	9.5	9.1	
Plts 10 ⁹ /L (140-400)	46	61	49	46	48	51	76	106	
ALP IU/L (30-130)		49	42	44	51	57	73	74	100
ALT IU/L (0-40)		441	428	701	3197	2621	1807	1290	185
Bili mmol/L (0-21)		9	13	8	18	18	16	11	4
Na mmol/L (133-146)	139	142	143	141	143	142	140	141	139
K+ mmol/L (3.5-5.3)	6.8	4	4.3	4.2	3.9	3.9	3.7		4.6
Urea mmol/L (2.5-7.8)		9.6	12.4	14	14.2	11.5	7.9	7.4	8.3
Creat mmol/L (48-128)	194	174	230	279	319	269	163	137	88
egfr mls/min/ 1.73 m ²	27	30	22	18	15	19	33	40	66
INR ratio	1.4	1.4	1.5	1.6	1.4	1.1	1		
PT secs (9.7-12.3)	14.8	15.1	15.9	16.7	15.1	11.5	10.6		
Fibrinogen g/L (1.9-3.1)	1.2	1.4	1.2	1.5	2.4	3.9	>4.5		

Pathophysiology of multi-organ failure following haemorrhagic shock

Our case clearly demonstrates the detrimental multi-systemic effects and subsequent threat to life created by haemorrhage from a ruptured ectopic pregnancy. Acute haemorrhage results in decreased cardiac output and pulse pressure that is detected by baroreceptors in the aortic arch and atrium. Neural reflexes subsequently cause an increased sympathetic outflow to the heart and other vital organs resulting in vasoconstriction, and redistribution of blood flow away from non-vital organs. Neuroendocrine responses activated by neural reflexes play a major role in homeostasis during haemorrhage. Elevated aldosterone and cortisol secondary to raised adrenocorticotrophic hormone secreted by the pituitary gland leads to increased water absorption in the kidneys. The reduced tissue perfusion to non-vital organs results in insufficient delivery of oxygen and nutrients required for cellular function.²

The resultant hypoxia leads to anaerobic metabolism and hence lactate production and metabolic acidosis. Hyperlactaemia is defined when serum lactate is greater than 4 mmol/l.³ A level of 15mmol/l as demonstrated by our case highlights the extent of shock the patient was in.

Endogenous heat production is restricted by anaerobic metabolism, which in turns exacerbates hypothermia that is likely to be predisposed by the administration of intravenous fluids and blood products. Hypothermia is one of the reversible causes of pulseless electrical activity and a core temperature of less than 35°C is itself an independent predictor of mortality after major haemorrhage.

Furthermore, our case revealed a severe acidosis with a pH of 6.8, which is reflective of widespread cellular anaerobic respiration secondary to hypoxia as a result of inadequate perfusion. Widespread literature has shown that a pH of less than 7.2 is associated with decreased contractility, low cardiac output, bradycardia, arrhythmias and decreased blood flow to the liver and kidneys. This can lead to multi-organ failure.⁶

Many patients with severe haemorrhage can establish coagulopathy very quickly as our case has demonstrated. At present there is nomenclature established definition of coagulopathy though many experts use prolonged prothrombin time as an indicator of coagulopathy. Our case presented with a prolonged prothrombin time of 14.8 seconds. The pathophysiology is complex and stems from immediate activation of multiple haemostatic pathways including

fibrinolysis, platelet and endothelium dysfunction. Furthermore, acute phase response after resuscitation measures can create a prothrombotic state. Sometimes, disseminated intravascular coagulation can occur in those who are insufficiently resuscitated or not resuscitated in a timely manner.⁷

Effective multi-disciplinary input

This case clearly highlights that the responsibility does not solely rely on the surgeon who is required to cease the bleeding but also on the multi-disciplinary specialists including paramedics, emergency clinicians, nursing staff, anaesthetists and haematologists. This is a vital component of resuscitation management during emergency situations.

Appropriate initial fluid management

The management with intravenous fluid resuscitation remains challenging as some evidence suggests that aggressive fluid resuscitation can be detrimental because it can lead to dislodging of clots and dilutional coagulopathy leading to increased risk of haemorrhage.⁵

Clinicians supporting this hypothesis suggest to cautiously administer fluid resuscitation with the aim of maintaining a subnormal blood pressure (systolic of 70-90 mmHg), whilst allowing sufficient oxygen delivery. The very early use of crystalloids and blood products is paramount to help treat acute coagulopathy.⁷

Immediate surgical treatment

Recourse to immediate surgical cessation of bleeding is a vital part of the resuscitation process, and must not be delayed.⁷The presence of free fluid in the abdomen and a positive pregnancy test immediately alerted an ectopic pregnancy as the most likely diagnosis. The majority of women of reproductive age are free of comorbidities with a greater ability to adapt to resuscitative measures and hence showing quicker recovery.

Conclusion

Teaching Points

1. Despite advances in the management of ectopic pregnancies an emphasis must be given on improving the understanding of the women and the healthcare professionals of the pathophysiology of haemorrhagic shock.
2. Educating the public and all health care professionals about the phrase "Think Ectopic" as a main differential in any women of childbearing age with atypical signs and symptoms of general ill health is paramount.

Despite advances in the management of ectopic pregnancies an emphasis must be given on improving the understanding of the women and the healthcare professionals of the pathophysiology of haemorrhagic shock. Educating the public and all health care professionals about the phrase "Think Ectopic" as a main differential in any women of childbearing age with atypical signs and symptoms of general ill health is paramount.

Furthermore, the significance of effective communication within multidisciplinary teams towards optimising patient care and saving lives cannot be understated.

Competing Interests

None declared

Author Details

SUCHETA JINDAL, Consultant Obstetrician & Gynaecologist, Pilgrim Hospital, United Lincolnshire Hospitals NHS Trust, UK, PE21 9QS. M MWEEMBA, ST4 Obstetrics and Gynaecology, Calderdale & Huddersfield Hospitals NHS Trust, Halifax, UK, HX3 0PW.

CORRESPONDENCE: SUCHETA JINDAL, Consultant Obstetrician & Gynaecologist, United Lincolnshire Hospitals NHS Trust, Pilgrim Hospital, Sibsey Road, Boston, Lincs, PE21 9QS.

Email: drsucheta@yahoo.com

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Skin and Seizures: Tuberous Sclerosis Complex, A Pictorial Essay

Murtaza Rashid, Samir Altalafha & Mohammed Al Mogbil

A 23 y/o male was brought to our Emergency Department after having a seizure. He was alert and his vital signs were stable. He is known to have epilepsy and is on regular anti-epileptic medication for three years. He is being followed up at a neighborhood medical center at his native village . On physical examination numerous brown papules were seen over his nose and both cheeks in a butterfly pattern which correspond to facial angiofibromas (Figure 1). Ash Leaf Hypomelanotic macules were seen over his extremities (Figure 2). Few hyperpigmented café au lait macules were observed over his trunk (Figure 3). A big fibroma was also seen over his scalp (Figure 4). Areas of thick leathery texture of orange peel known as Shagreen patches were observed on back (Figure 5).

Figure 1: Facial angiofibromas



Figure 2: Ash Leaf spot



Figure 3: Cafe au lait macule



Figure 4: Scalp fibroma



Figure 5: Shagreen patch



A Brain CT scan revealed multiple subependymal giant cell astrocytomas. Laboratory investigations were normal.

This patient was clinically diagnosed as Tuberous Sclerosis Complex having a myriad of skin lesions.¹

Tuberous sclerosis complex is an autosomal-dominant, neurocutaneous, multisystem disorder characterized by cellular hyperplasia and tissue dysplasia.² Seizures are commonly encountered in Emergency Room however, conspicuous lesions as described above must alert the physician to guide the patient for a multidisciplinary approach.³

Competing Interests

None declared

Author Details

MURTAZA RASHID; M.D Medicine; Royal Commission Hospital, Jubail, Saudi Arabia. SAMIR ALTALAFHA; M.D Emergency Medicine, Fellowship Critical Care, Royal Commission Hospital, Jubail, Saudi Arabia. MOHAMMED ALMOGBIL; M.D, FRCPC, Pediatric Emergency Medicine,

Royal Commission Hospital, Jubail, Saudi Arabia.

CORRESPONDENCE: MURTAZA RASHID; M.D.;
Department Of Emergency Medicine, Royal Commission
Hospital, Jubail Industrial City, 31961, Saudi Arabia
Email: dr.murtazarashid@gmail.com

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Splenic tuberculosis : Report of two cases and literature review

Ibrahim Masoodi

Abstract

Tuberculosis is endemic in many developing nations of the world. However, with the epidemic of AIDS, the disease has re-emerged in advanced countries as well. Tuberculosis presenting as pyrexia of unknown origin is well known and can affect any organ in the body. Two patients presented with pyrexia of unknown origin and on evaluation splenic lesions were discovered which proved to be splenic tuberculosis after fine needle aspiration. Both patients were HIV negative. One patient had well controlled diabetes mellitus while as another patient had no co morbidities at all. Splenic abscesses could be one of the complications of bacterial Endocarditis and in the past splenectomy used to be the treatment of choice. But now CT-guided aspirations and demonstration of AFB have eased out management in these cases. After the demonstration of acid-fast bacilli both patients improved after therapy with antitubercular treatment. Clinical description and literature review is described in this brief report.

Keywords: Tuberculosis, HIV, Diabetes mellitus , Fever of unknown origin

Introduction

Isolated splenic tuberculosis is extremely rare, particularly in the immunocompetent persons. Splenic tuberculosis, however, can be part of military tuberculosis in immunocompromised patients. Tuberculosis spleen invariably presents in the form of an abscess. The risk factors for splenic abscess described in the literature are sickle cell disease, hemoglobinopathies, splenic trauma endocarditis or tuberculosis elsewhere in an immunocompetent patient. Although rare cases of splenic tuberculosis in immunocompetent patients have been described in the past. With re-emergence of tuberculosis due to AIDS and use of immunosuppressive medications around the globe, it is very important to bear this rare clinical condition while evaluating pyrexia of unknown origin in a given case.

Case 1

A 54-year-old male vet nary doctor by profession presented with the history of off and on fever of 8 weeks duration. The fever was low grade, intermittent and was associated with weight loss of 4 kilograms. There was no evening rise of temp and no sweating. The patient denied any history of a cough, urinary symptoms or diarrhoea. There was no history of travel or contact with sick people. He had been type II diabetic for last 12 years controlled on oral hypoglycemic agents and had no history of acute or chronic complications. There was no history of tuberculosis in the past or in close contacts . He was non-alcoholic and denied any high-risk behaviour. The clinical examination revealed an average built person who was conscious oriented and had stable vitals. There was no jaundice or lymphadenopathy. Abdominal examination revealed moderate

splenomegaly. The liver was not palpable and there was no ascites. Respiratory and cardiovascular systems were normal. During the hospitalisation temp. recorded ranged from 38^o C to 39^oC with no night sweats during his hospital stay. Patient's evaluation showed haemoglobin levels of 10.5g/dl Leukocyte and platelet counts were normal. ESR was 88mm for the first hour. The tests on kidney and liver functions were normal. An ultrasound abdomen showed the presence of two heterogenic space occupying lesions measuring 3×4cms suggestive of splenic abscesses. An echocardiogram was done to rule out any features of subacute bacterial endocarditis. All the valves of his heart were normal and no feature of endocarditis was noted. The patient had normal ejection fraction and the pericardial cavity was normal too. Blood cultures and urine cultures were found to be sterile. A 24-hour collection of urine showed no evidence of albuminuria and funduscopic examination ruled out retinopathy. Keeping in view splenic abscesses CT guided fine needle aspiration was done and acid-fast bacillus were demonstrated by Zeal-Neilson s stain and the patient was put on antitubercular treatment. The culture of the aspirate a few weeks later turned out to be positive for Mycobacterium tuberculosis. His HIV serology was negative .The patient continued standard four-drug regimen for two months followed by two drug regimen for another seven months. Patients fever settled after two weeks of treatment and followed our clinic till completion of his treatment.

Case 2

A 24-year-old female student presented with the history of off and on fever of 5 weeks duration. The fever was low grade intermittent and not associated with sweating She also

complained of loss of appetite and weight loss of 3 kilogrammes over a period of 2 months. She denied any history of a cough, urinary symptoms. The patient had no history of contact with sick persons or travel. She had no co-morbid illness. On examination she was conscious, oriented and had mild pallor, no lymphadenopathy or jaundice was noted. Her respiratory and cardiovascular system was normal. Abdominal examination showed splenomegaly 5 cms below the costal margin. Her laboratory data showed haemoglobin levels of 9.8 gm/dl, WBC count of 4200 and platelets were 1.5×10^3 . ESR was 90 mm in the first hour. Blood culture, Widal tests and Brucella serology were negative. Tests on liver and kidney functions were normal. An ultrasound abdomen showed the presence of three small space-occupying lesions in the spleen. Each was measuring 2x2 cms. Portal vein diameter and spleno-portal axis were normal. CT scan abdomen confirmed splenic abscesses and no abdominal lymphadenopathy was noted. CT-guided fine needle aspiration was done which turned out to be positive for AFB and cultures a few weeks later confirmed Mycobacterium tuberculosis. Her transthoracic echocardiography showed normal values and didn't show any features of vegetations. Her HIV serology was negative. The patient was started on conventional four-drug anti-tubercular regimen for two months followed by two-drug regimen for another seven months. Her fever settled and she had marked improvement in her appetite and her weight increased.

Discussion

Splenic abscesses presenting as fever of unknown origin is well known. Most of the cases of TB spleen present as fever, vague ache in left hypochondrium or weight loss. Although the frequency of splenic tuberculosis is more common in immunosuppressed patients, splenic abscess due to tuberculosis has been described in immune-competent patients as well¹. Due to the advent of AIDS, the prevalence of tuberculosis has increased globally and more cases are now getting reported. Another scenario leading to increased frequency of this previously rare entity is the widespread use of immunosuppressed therapies for chronic disorders like Rheumatoid arthritis, Crohn's disease, Psoriasis etc. The index cases were neither HIV positive nor were on any immunosuppressant medication but developed splenic lesions, reflecting some other hitherto unknown predisposing factor for such lesions. The splenic abscess does occur in the setting of infective endocarditis as infective emboli get lodged in the spleen. Splenic abscess following endocarditis in an 80-year-old male presenting with abdominal pain during the course of treatment was reported by Pereira et al² and in another series³ of 3 patients with bacterial endocarditis, splenic abscess was diagnosed based on CT abdomen with evidence of endocarditis on Echocardiography. In the same series, two of the patients underwent splenectomy before valve repair while splenectomy was performed after the valve repair in the other patient. The echocardiogram in index cases, however, were normal without any evidence of endocarditis. After the

diagnosis and initiation of ATT, the index cases became afebrile and splenectomy was thus averted. While one of the cases had well-controlled diabetes mellitus but the other patient was euglycemic and had no other known risk factor for splenic tuberculosis as is described in the literature. What led to splenic tuberculosis in the second case remained unidentified? There is a well-known linkage between diabetes mellitus and TB and as per WHO, a bidirectional screening has been recommended. Sri Lankan data⁴ on 112 patients with TB found that 8 patients with TB already were already known cases of diabetes mellitus and in their study further screening unravelled TB in another 17 patients. It is thought that metabolic adaptation is critical during the pathogenesis of Mycobacterium tuberculosis^{5,6}.

In-time management of tubercular abscess is very crucial as without treatment patients can have a complicated clinical course. Splenic abscess can rarely rupture or lead to fistulous communication with adjacent organs. A gastro-splenic fistula has been reported by Lee et al⁷ in a 61-year-old male presenting with abdominal discomfort and cough. The authors demonstrated a fistulous tract between the spleen and the stomach on endoscopic examination. The fistulous track healed in their case after completion of anti-tubercular treatment. It is quite possible that delay in diagnosis may be a factor that leads to such complications. The index cases, however, had a favourable outcome without any complications and successfully completed anti-tubercular treatment.

The other side of the coin is that complications are even known during the anti-tubercular treatment as a result of reaction to anti-tubercular treatment. Spontaneous rupture during treatment leading to splenectomy was reported by Yea et al⁸. Splenic tubercular abscesses are known to be associated with miliary tuberculosis or with haematological diseases where leucopenia and thrombocytopenia are profound⁹. The index cases had normal platelet count and leucocytic count, highlighting that there was neither bone marrow suppression nor hypersplenism. The patients with ITP on treatment are also prone to develop Tuberculosis of spleen and conversely, patients with TB spleen can per se develop thrombocytopenia.

The management of splenic abscess used to be splenectomy in the past but with the advent of FNAC, splenectomy is avoided. Here a word of caution is that various other lesions in spleen can mimic splenic TB, hence it is very important to confirm the disease especially in endemic areas where TB is prevalent. Kunnathuparambil et al¹⁰ described melioidosis in a 47-year-old male who was treated as a case of splenic tuberculosis based on splenic lesions on imaging and fever. The diagnosis of splenic tuberculosis in the past was mainly reached after histological examination of surgical specimens but now fine needle aspiration has become the procedure of choice. Spleen being a highly vascular organ, bleeding is the most feared complication of any intervention but fine needle aspiration has been found to be technically safe and in a retrospective data, no significant complication was observed¹¹. With the advent of non-invasive

biomarkers diagnosis of tuberculosis has advanced further and a step further is Quantiferon Gold test which has come up another non-invasive modality in the diagnosis of TB. In various studies¹², the sensitivity of this test to the tune of 75% has been demonstrated.

While treating an HIV patient the clinician requires high alert in patients presenting with pain abdomen as the splenic abscess is one of the differentials and it is recommended that initial ultrasound must be carried out to diagnose this condition¹³. In modern era, Splenectomy may be offered only to resistant cases otherwise ATT is considered to be the therapy of choice.

To conclude tuberculosis of spleen must be kept in mind while evaluating fever of unknown origin in any patient on immunosuppressant treatment or having HIV and even in immunocompetent patients as well. The Fine needle aspiration is a safe diagnostic modality and treatment with antitubercular medication is rarely unsuccessful.

Competing Interests

None declared

Author Details

IBRAHIM MASOODI; MD, DM(Gastroenterology), FACP; Associate Professor, Taif University, Saudi Arabia

CORRESPONDENCE: IBRAHIM MASOODI; MD, DM(Gastroenterology), FACP; Associate Professor, College of Medicine, Post Box 888, Taif University, Taif, Saudi Arabia 21974

Email: ibrahimmasoodi@yahoo.co.in

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Can telephone triage in primary care help in earlier diagnosis of cancer?

Ejaz Mahmood, Jonathan Griffiths & Yuhua Su

Abstract

Aims: One of the main focus points in General Practice is to identify symptoms and signs of cancers for early diagnosis to improve outcomes. Our study aims to assess if telephone triage helped in prioritising early assessment and referral of patients who were diagnosed with a cancer.

Methods: A retrospective study of first presentation of patients to primary care who were subsequently diagnosed with a cancer. Patients had an option to speak to a triaging clinician for the same day appointment or book next available appointment. An analysis is performed on these 2 groups to assess if there is difference in time between the first contact with GP practice and clinic assessment in 1) Primary Care and 2) Secondary care.

Results: 39 patients were included in the study. Among them, 13 (33%) used telephone triage to make their appointments and 26 (67%) booked their appointment by themselves. The average waiting time required for assessment in GP clinic (primary care) was 0.77 days for triaged patients and the average time required for rest of the patients was 7.88 days. The results of Wilcoxon rank-sum test indicated that this was a statistically significant difference in time ($p = 0.0020$). The average waiting time till face to face appointment in secondary care was 19.54 days for triaged patients and 35.69 days for the rest. The results of Wilcoxon rank-sum test indicated that this was a statistically significant difference in time. ($p = 0.0474$).

Conclusion: Our study demonstrated that telephone triage reduced the time from the first primary care contact to face to face assessments in primary and secondary care. Telephone triage should not only be seen as a way of managing demands and appointments but also as a system to improve patient outcome.

Keywords: Telephone, Triage, Cancer, Diagnosis

Abbreviations: GP- General Practitioner.

Introduction

Telephone triage has been used by many practices in primary care to manage workload and prioritise patients for same day appointments.^{1,2} Telephone triage may have benefits in terms of managing work load,³ but is also associated with certain risks,⁴ which has worried both clinicians and patients.⁵ The analysis of the use of telephone triage has so far focused on the ease of access, demand management, cost effectiveness, quality of consultations, safety and patient satisfaction. However, other effects in terms of patient outcome may exist. One of the main focuses in General Practice is to identify symptoms and signs of cancer for early diagnosis to improve outcome. Our study aims to assess whether telephone triage helps in prioritising early assessment and referral of patients who are subsequently diagnosed with cancer.

Methods

A retrospective analysis of all the patients at our practice who had a diagnosis of cancer made between April 2013 and December 2014 was carried out.

Patients have a choice of 2 different ways to book an appointment in our practice.

- Telephone triage for same day appointment requests, where a triaging doctor decides about the urgency of a problem and books the appointment, arranges tests or gives advice after speaking to patients over the phone. This group is referred as “Group 1” in this study.
- Patients book the next available appointment to see a GP through reception without any triage. This group is referred to as “Group 2” in this study.

The date of first contact with the GP practice for the symptoms which later lead to a diagnosis of cancer was noted for both groups. This was the telephone triage date for the first group and the date the appointment was booked by the patients for the second group. The date the patient was first seen in secondary care for further assessment and investigations was also noted. The duration between first contact with GP practice and GP appointment, and the duration between the first contact with practice and first hospital appointment were calculated. This information was gathered from practice computer records.

Patients who were diagnosed with cancer through screening were excluded. Slow growing tumours which do not merit a 2-week rule referral, such as basal cell cancer of skin were excluded. Patients whose appointments were initiated by the GP on reviewing the results of routine tests were not included. Patients diagnosed with cancer in hospital without going through primary care referral were also excluded from this study.

There are two research questions:

- Is there a significant difference in the time required from the first contact with primary care to the GP Clinic appointment between Group 1 and Group 2 patients?
- Is there a significant difference in the time required from the first contact with primary care to the date the patient was seen in the secondary care between Group 1 and Group 2 patients?

Descriptive statistics (such as the mean, standard deviation, median, minimum, and maximum) were used to present the time required from the first contact with primary care to the GP Clinic appointment; and the time required from the first contact with primary care to the date patient seen in the hospital, for Group 1 and Group 2 patients. Wilcoxon rank-sum test was used to answer each research question. A p-value less than 0.05 indicated significance at the 0.05 level.

All data analyses were conducted using SAS.

Results

A total number of 39 patients were included in the study. Among them, 13 (33%) used telephone triage to make their appointments and 26 (67%) booked their appointment by themselves.

Figure 1 shows the bar charts of the time required from the first contact to GP practice, to the GP clinic appointment for Group 1 and Group 2 patients. It took 0-3 days for 12 Group 1 patients and 8-11 days for 1 Group 1 patient. The time required from the first contact to GP practice to the GP Clinic appointment for Group 2 patients can be illustrated by the same manner.

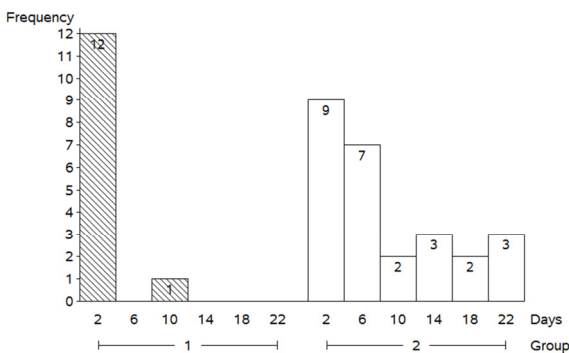


Figure 1: Bar charts of the time (days) required from the first contact for surgery to the GP Clinic appointment for Group 1 and Group 2 patients. (Note that the midpoints 2, 6, 10, 14,

18, and 22 represented days within the range of 0-3, 4-7, 8-11, 12-15, 16-19, and 20-23, respectively.)

Table 1 shows the summary statistics for the time (days) required from the first contact with the practice, to the GP Clinic appointment for Group 1 and Group 2 patients. The average time required was 0.77 days for Group 1 patients and the average time required for Group 2 patients was 7.88 days. The results of Wilcoxon rank-sum test indicated that this was a statistically significant difference in time required from the first contact for surgery to the GP Clinic appointment between Group 1 patients (patients using Telephone triage to make their appointments) and Group 2 patients (patients booking their appointment by themselves) (p = 0.0020).

	Number	Mean	SD	Median	Min	Max
Group 1	13	0.77	2.24	0	0	8
Group 2	26	7.88	7.53	6	0	23

Table 1: Summary statistics for the time (days) required from the first contact for surgery to the GP Clinic appointment for Group 1 and Group 2 patients. SD = standard deviation.

Figure 2 shows the bar charts of the time required from the first contact with the GP practice, to the date patients were seen in the secondary care for Group 1 and Group 2 patients. It took 0-5 days for 4 Group 1 patients, 10-19 days for 5 Group 1 patients, 20-29 days for 1 Group 1 patient, 30-39 days for 2 Group 1 patients, and 90-99 days for 1 Group 1 patient. The time required from the first primary care contact to the date patient seen in the secondary care for Group 2 patients can be illustrated by the same manner.

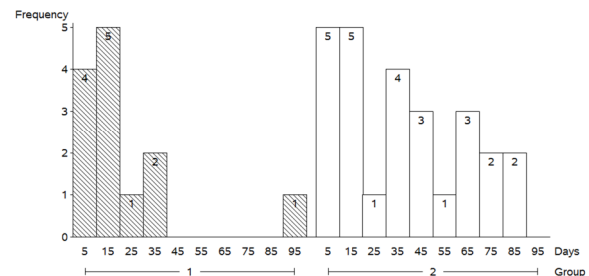


Figure 2: the bar charts of the time required from the first contact for surgery to the date patient seen in the hospital for Group 1 and Group 2 patients. (Note that the midpoints 5, 15, 25, 35, 45, 55, 65, 75, 85 and 95 represented days within the range of 0-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80-89 and 90-99, respectively).

Table 2 shows the summary statistics for the time (days) required from first contact with GP practice to the date patients were seen in the hospital for Group 1 and Group 2 patients. The average time required for Group 1 patients was 19.54 days and the average time required for Group 2 patients was 35.69 days. The results of Wilcoxon rank-sum test indicated that this was a statistically significant difference in time required from the first contact to the primary care to the date patient seen in the hospital between Group 1 patients (patients using Telephone triage to make their appointments) and Group 2

patients (patients booking their appointment by themselves) ($p = 0.0474$).

	Number	Mean	SD	Median	Min	Max
Group 1	13	19.54	23.41	10.00	3	90
Group 2	26	35.69	26.28	32.50	1	88

Table 2: Summary statistics for the time (days) required from the first contact for surgery to the date patient seen in the hospital for Group 1 and Group 2 patients. SD = standard deviation.

Type of Cancer	Number of Patients
Lung	5
Breast	5
Colorectal	4
Malignant melanoma of Skin	3
Squamous Cell carcinoma of Skin	3
Oesophagous	2
Stomach	2
Urinary Bladder	2
Larynx	2
Pancreas	1
Endometrium	1
Cervix	1
Kidney	1
Prostate	1
Testis	1
Tonsil	1
Lymphoma	1
Appendix	1
Myelodysplastic	1
Olfactory Neuroblastoma	1

Table 3: Number of patients with types of cancer.

Discussion

More than 90% of contacts with healthcare in the UK occur in primary care.⁶ The estimated numbers of consultation for a typical practice in England rose from 21,100 in 1995 to 34,200 in 2008 as per analysis conducted by Hippisley-Cox J et al.⁷ With increasing demands being placed upon General Practice, there is a need to explore innovative ways of working which enable the prioritisation of patients with concerning symptoms. Telephone triage has been considered to reduce the demand for face-to-face consultation with GPs,³ which can potentially free up time for effective use. NHS England report 'Transforming Urgent and Emergency Care Service in England' suggests GPs should offer more telephone consultations to reduce pressure on accident and emergency.⁸ However, a cluster-randomised controlled trial (The Esteem Trial) across 42 practices showed that telephone triage increased the number of primary care contacts in the following 28 days, after patients' request for same day GP consultation.¹

With increasing demands for consultations, it is important to have a system to identify and prioritise patients for early assessment; who may have a suspected cancer diagnosis. Our study demonstrates that telephone triage reduces the time from first primary care contact to face to face assessment in primary and secondary care for patients with suspected cancer. Patient numbers are small and the sample is from one practice, yet the difference seen is statistically significant.

Cancer stage at diagnosis is one of the major reasons for difference in cancer survival in different countries.^{9,10} The delay in cancer diagnosis can be due to multiple factors. Telephone triage can provide an opportunity to patients to discuss symptoms early with a GP, and this can reduce delays in the cancer diagnosis pathway. It has been shown that certain alarm symptoms are associated with the likelihood of cancer diagnosis¹¹ and these can be used to prioritise the patients in triage process. It may also reduce anxiety amongst patients waiting for an appointment, who are concerned about their symptoms.

Telephone triage should not only be seen as a way of managing demands and appointments but also as a system to improve patient outcome. Further research is clearly needed on a larger scale to determine if the results are reproducible in other settings as patients' knowledge and understanding about cancer warning symptoms and healthcare seeking behaviour may vary among different population sets.

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ANGELA ROBERTS, Practice Development Manager, Swallow Medical Centre.

Competing Interests

None declared

Author Details

EJAZ MAHMOOD, MBBS, MRCP, Swanlow Medical Centre, Dene Drive, Winsford, CW71AT, UK. JONATHAN GRIFFITHS, MBChB, MRCP, Swallow Medical Centre, Dene Drive, Winsford, CW71AT, UK. YUHUA SU, PhD IN STATISTICS, Dr. Su Statistics, Kaunakakai, Hawaii, USA. CORRESPONDENCE: EJAZ MAHMOOD, 1325, Osbourne Avenue, Roslyn, PA 19001. USA Email: ejazmahmood78@gmail.com

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Improving Medical Student Placements in Psychiatry: Review of Literature And A Practical Example

Yasir Hameed, Roger Wesby, Syvarna Wagle, Stephen Agius, Jonathan Hillam & Andrew Tarbuck

Abstract

The support of medical students during their placement in busy clinical settings is an important topic. Clinicians and other health professionals have a duty to provide teaching to medical students and supporting them to achieve their learning objectives.

This paper reviews the literature on workplace learning and discusses the importance of providing a fruitful and welcoming clinical placement to medical students in Old Age Psychiatry. It then describes a local scheme to improve medical students placement and how the changes introduced in this scheme helped to enhance learning and satisfaction of the medical students.

Although the paper discusses the students placement in Old Age Psychiatry, it is relevant to all other medical and surgical specialities where busy clinicians face many challenges in providing teaching to medical students.

The scheme described in this paper to improve students placement used existing resources and encouraged the input from professionals working within the team (e.g., psychologists, nurses and support workers) to enrich the students placement. Using this multidisciplinary model of teaching and supervision helped to overcome many challenges in providing a positive and useful clinical placement to the medical students.

Keywords: Clinical, Education environment, Best evidence medical education. Medical students. Psychiatry.

Introduction

The Royal College of Psychiatrists (RCPsych) launched its five-year Recruitment Strategy in 2011 aiming to achieve a 50% improvement in recruitment to core psychiatry training and a 95% fill rate of posts by the end of the five-year campaign⁽¹⁾. The primary focus of this campaign was on recruiting UK medical graduates.

Two of the Strategy's main aims were to highlight good practice in undergraduate teaching and to improve the teaching skills of psychiatrists to inspire and influence medical students during their psychiatry curriculum.

The Strategy stressed the importance of good clinical placements in psychiatry and recommended that medical students should ideally be placed only with 'the best teachers and welcoming teams' avoiding colleagues who are disillusioned with psychiatry or not happy with their jobs.

It is therefore essential that psychiatrists and other clinicians play an important role to improve the medical students placement in their workplace in order to give the students a positive experience of this speciality and hopefully promote it as a future career option.

Background

Fourth-year medical students from the University of East Anglia (UEA) spend two months rotating through various mental health services as part of their clinical placement in the

Mind Module (also known as Clinical Psychiatry or Module 11).

As part of this rotation, students are placed in Old Age Psychiatry for six days over a two-week period. They shadow clinicians in two community teams, two inpatient wards and the Electro-Convulsive Therapy (ECT) clinic. All of these teams are based at the Julian Hospital in Norwich.

The students are encouraged to talk to patients and carers and perform basic clinical tasks such as mental state examination and risk assessment. Table 1 summarises the learning outcomes for students during their placement.

Table 1- The learning outcomes for students during their Old Age Psychiatry placement
Gain clinical experience of diagnosis and management of mental health problems (including dementia) in older people.
Improve the communication skills with regard to interactions with older people with mental disorders and their carers.
Enhance the student's understanding of the nature of the multi-disciplinary team (MDT) model in mental health for older people, particularly the social aspect of care and end of life care.

After each rotation, each student is asked to complete a feedback form regarding their placement. This feedback helps the module leads and clinicians to improve the students learning experience.

Before the implementation of our placement improvement project, the students did not feel that they were meeting their learning outcomes. Table 2 summarises the major areas that needed improvement.

Table 2- Areas needed to improve before the implementation of the new placement structure
Poor planning and organisation of the clinical placement.
Inadequate or no information sent before starting the placement.
Lack of a dedicated coordinator to design the placement timetable and allocate students to specific clinicians
Lack of multidisciplinary teaching and hence poor understanding of the various roles of professionals (e.g., memory assessors, community nurses, support workers, etc.).
Students felt that clinicians were too pressured to supervise students. Some students reported that they were sometimes sent off as the staff had been too busy or there insufficient volunteers from clinical staff to take a student.

Student dissatisfaction with clinical placements is not unique to psychiatry. Research has shown that educators and learners face significant challenges when teaching and learning take place in any clinical setting. See Table 3 for a summary.

Table 3- Challenges of teaching in clinical settings (modified from Spencer, 2003)
Limited clinician time allocated to teaching activities.
Administrative duties (dictating letters, writing notes, answering emails).
High number of students allocated to few clinicians.
Difficulty in seeing patients (e.g., patients refusing the presence of a student).
Clinical setting is not 'teacher friendly' (overcrowded, too small, noisy and/or lacking privacy to interview and examine patients).
Lack of rewards and recognition for the clinical educators.

One of the biggest challenges of teaching in clinical settings is how to provide a welcoming and supportive learning environment in a busy and time constrained practice. We found that one of the main reasons for clinicians to be reluctant to have students shadowing them is the challenge of providing a dual role of caring and teaching simultaneously.

The placement improvement project

The improved structure of the student's placement in Old Age psychiatry was based on the tenet that clinical placements should provide various clinical experiences that include interaction with patients and professionals from various grades in addition to face to face teaching in small groups⁽³⁾. The authors took over full responsibility for coordinating the students' placements and liaising with the various supervising clinical teams. This ensured clear leadership and consistency in organising the placement.

The improved placement structure started in October 2015 with the first cohort of medical students coming to their clinical placement after the summer break. Table 4 gives a summary of the changes implemented.

The information pack sent to the students before the placement contained information about the hospital environment (location, map, parking, travel arrangements, key codes and useful contact numbers) and a detailed timetable (and email address) of the clinician supervising the student each day during the placement. Also, it included useful information about the mental state examination and the Mental Health Act,

information that had been requested previously by medical students.

Table 4- Changes to improve the clinical placement in Old Age Psychiatry
Compiling a 'welcome pack' and sending it by email to the students before the clinical placement.
A "Meet and Greet" event on the first day of the clinical placement was introduced comprising of several clinicians who operate on a rota basis.
Involvement of all professionals in the MDT (including Staff and Associate Specialists, community and memory nurses, junior doctors and clinical psychologists in addition to consultant psychiatrists).
Introduction of a Balint-style psychotherapy group aiming to facilitate discussion in a safe and containing environment of the emotional impact of patients encountered.
Designing a weekly one-hour teaching session supervised by a senior clinician and facilitated by a trainee psychiatrist.
Each clinician received a formal letter of thanks from the Head of Norwich Medical School, the Module Lead and the Secondary Care Lead certifying their contribution to the education of medical students and thanking them for their work.

Sending information before the placement has been shown to be beneficial in students' electives⁽⁴⁾ and this is especially important in psychiatry which can be experienced as less structured than other medical specialities and where students are required to travel to various hospitals and clinics bases. As a result, students felt that they were expected and had a clearer sense of where they should be and who would be supervising or teaching them. Later student feedback reported that these changes had contributed directly to an improved learning experience.

The timetable design ensured that every student would have the chance to experience working in several settings in Old Age Psychiatry, including community, inpatients, ECT and the Memory Clinic. It was also noted that a two-week placement in any psychiatric team could not easily give a student a sense of patient 'recovery'. It was, therefore, decided that students see a patient who had been discharged from the ward, e.g. with the care coordinator.

The rota of the 'Meet and Greet' event on the first day of the placement ensured that the workload is spread among the clinicians and helped sustain the necessary levels of enthusiasm and energy. Previously, this task had repeatedly fallen to just a few clinicians.

The participation of all professionals in the clinical team in supervision and teaching helped the students to better understand the different roles of clinicians within the multidisciplinary team and enriched their learning experience. To achieve this, we attempted to allocate sessions with a clinical psychologist, care coordinators, memory assessment nurses and members of the intensive support team. It also had the bonus of ensuring that the workload of teaching was spread more equally among clinicians.

Attendance at ward rounds and community MDT meetings could be a valuable experience but only if the process is explained, and – in the ward round – the student is briefed on the clinical history and background of the patients. For these

reasons, supervising clinicians were reminded to give this information to the students attending such meetings.

The weekly teaching sessions provided an opportunity for the students to present case histories of patients they had seen and to discuss their management. Clinicians could also give a formal didactic teaching on a specific topic, for example, mental state assessment or risk assessment in psychiatry.

The letters of thanks to the participating clinicians served as an added benefit (in addition to the satisfaction of teaching others) to sustain their motivation and reward them for their contribution to the teaching of medical students. The psychiatric trainees used the letter to demonstrate their skills in teaching in their portfolio.

Benefits of the new placement structure

Helping students to feel supported before, during and even after their placements was a high priority in this project. Research has shown that learners rank the need for support and guidance in workplace environments as high and it is an essential requirement for a successful learning experience⁽⁵⁾. This extra support is particularly crucial in psychiatry which is perceived by many students to be difficult and challenging⁽⁶⁾.

The support provided to the students in the improved structure was in the form of having the contact details of the rota coordinators, their supervising clinicians, the administration team (medical secretaries, site manager for parking permits) and some other useful numbers for various locations and clinics.

While improving the organisation of the placement, changes were aimed to reduce the commitment of teaching and supervision for clinicians and spread it more equally among the members of the team.

Students reported that they found home visits during the placement the most useful part of their placement and the most interesting. This is an invaluable experience with the student having a significant amount of time in a one to one interaction with a clinician (including during the travel from one location to another) and then observing the clinician 'in action' with patients at home. This experience highlights the role of 'professional socialisation'⁽⁷⁾ that is considered by educators as a significant process in the development of a sense of a shared professional identity and responsibility in both the clinician and the learner.

Furthermore, using non-medical professionals to supervise and teach students has been valued by students⁽⁸⁾. It enriched the clinical placement with the concept of (Inter-Professional Learning) which is an active learning from and with professionals from other disciplines allied to medicine. This style of education has been shown to improve students' communication with professionals from different disciplines and to have a better understanding of the nature of the multidisciplinary teamwork and the roles of each member of the team⁽⁹⁾.

While improving the organisation of the placement, changes were aimed to reduce the commitment of teaching and supervision for clinicians and spread it more equally among the members of the team.

Balint groups and improving student placements in psychiatry

Balint groups were pioneered by the Hungarian psychoanalyst Michael Balint who introduced this model in the late 1950s after running seminars for general practitioners in the UK with his wife, Enid.⁽¹⁰⁾

Balint recognised the intense emotions that affect the doctor and the patient and encouraged clinicians to talk about these feelings in groups, which later came to be known as Balint groups.

Research has shown that Balint groups for medical students can increase the students' empathy towards patients with chronic mental illness and improve their ability to cope with complex clinical situations⁽¹¹⁾. It also helps them to engage in reflection about their professional growth and to develop their identity as future doctors⁽¹²⁾. Most importantly, this psychotherapeutic approach it allows them to reach a deeper understanding of the emotional impact of their patients⁽¹³⁾. It was felt that the students would benefit from this model to help with the various emotions evoked by dealing with patients they would encounter in Old Age Psychiatry, in particular, dementia.

The student feedback was very positive for the Balint group. One student commented. *It is inevitable to have experiences with patients that leave you with a feeling, whether that be positive or negative. To be able to look back at those times, talk them through, be listened to and have others reflect things back that you may not necessarily have realised yourself, is invaluable.*

Patient and carer involvement in clinical education

Clinical education in the workplace has always depended on patients and carers in its design and delivery. Students value seeing patients and learning from their experiences. However, the evidence suggests that patients are not routinely involved in the design of the curriculum or clinical placements despite calls to actively engage them in teaching and training⁽¹⁴⁾.

Students were given the opportunity to learn from patients and carers through regular and supervised contact with them. They also attended a workshop on dementia and viewed a DVD showing the experiences of a woman with dementia and depicting how the world might be seen from her perspective. Feedback from students was very positive for these opportunities.

Medical students placement and Electro-Convulsive Therapy (ECT)

Students are allocated to spend one day in ECT clinic during their two-week placement in Old Age Psychiatry. Research has shown that many medical students have negative attitudes and unjustified reservations about ECT and its therapeutic applications⁽¹⁵⁾. However, these views can change with

education about this therapy during clinical placements and encouragement of the students to talk to patients and read about its indications and effectiveness in people with severe mental illness⁽¹⁶⁾. Seeing the procedure first hand would, therefore, help the student gain confidence to challenge the stigma attached to ECT and to explain this treatment to their future patients.

Feedback from the students following the implementation of the placement improvement project

The feedback from medical students and clinicians was very positive. The students enjoyed their placements and felt that they gained useful knowledge and skills. Above all, they felt welcomed in the clinical settings and settled very nicely into the teams.

Figures 1 and two summarise some comments from the medical students following the placement. This feedback was collected by Norwich Medical School as part of the regular monitoring of clinical placement for medical students.

Figures 1 and 2: Feedback from students after the implementation of the changes to the clinical placement:

'Best part of placement. Doctors were all happy to have us and teach. It was well organised, I felt that we were welcomed and always expected. It was varied and generally useful to my learning needs'.
Student ID 69. End of Module 11 feedback.

'This was one of the best placements in psychiatry, each doctor was very helpful and especially keen on teaching. It was really good to not only see the patients on the ward but so helpful to go on home visits to see assessments in patients own home. Really enjoyed this placement'.
Student ID 95.

Limitations

There were some challenges in the implementation of this improved model. First is not always easy to recruit non-medical members of the clinical teams to take students. There are some reasons for this including lack of confidence or experience in teaching, a belief that it is "not their role", or concern about the increasing demands on their time. Others already had students in their discipline. This was addressed by briefing the professionals about what the students need to achieve at the end of the placement and encouraging them to be involved in the supervision. The introduction of nursing revalidation in April 2016 may help more nurses to get involved.⁽¹⁷⁾

Conclusions and recommendations

This paper describes a clinical placement improvement project for medical students in Old Age Psychiatry. The changes focused on the enhancement of organisation, supervision and teaching.

Our improvement project is ongoing, and there are areas needing further improvement, for example, more active involvement of patients and carers in the teaching and learning of medical students is necessary. It is planned to achieve this by inviting patients and carers to tell their personal stories to the students in a small group.

Organisers of students' placement in secondary or primary care need a systematic approach to filling allocation slots to ensure that all students receive a similar and broad exposure to their speciality. It can be dispiriting and stressful to ask for volunteers constantly. They need to have good relationships with their clinical colleagues of all disciplines, and to be willing and assertive enough to go around and ask colleagues in person rather than sending email requests.

Psychiatric educators have a significant role to play in the improvement of clinical placements for students as this will hopefully contribute to improving recruitment to this medical speciality that is undergoing a recruitment crisis. Research has shown that there is a positive correlation between the length and quality of clinical placement and the likelihood of choosing psychiatry as a future career.⁽¹⁸⁾

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Competing Interests

None declared

Author Details

YASIR HAMEED (MRCPsych, PgDip Clin Edu, FHEA), Honorary Senior Lecturer (Norwich Medical School, University of East Anglia), Consultant in Adult and Older Adult Psychiatry. Norfolk and Suffolk NHS Foundation Trust. Hellesdon Hospital. Norwich. NR6 5BE. ROGER WESBY (MRCPsych), Consultant in Old Age Psychiatry. Norfolk and Suffolk NHS Foundation Trust. Hellesdon Hospital. Norwich. NR6 5BE. SUVARNA WAGLE (MRCPsych), Consultant in Old Age Psychiatry. Norfolk and Suffolk NHS Foundation Trust. Hellesdon Hospital. Norwich. NR6 5BE. ANDREW TARBUCK, (BM BCh, MA, FRCPsych), Consultant in Old Age Psychiatry. Norfolk and Suffolk NHS Foundation Trust. Hellesdon Hospital. Norwich. NR6 5BE. STEPHEN AGIUS (MD), Associate Specialist. Norfolk and Suffolk NHS Foundation Trust. Hellesdon Hospital. Norwich. NR6 5BE.

JONATHAN HILLAM (MRCPsych), Consultant in Old Age Psychiatry. Norfolk and Suffolk NHS Foundation Trust. Hellesdon Hospital. Norwich. NR6 5BE.
 CORRESPONDENCE: YASIR HAMEED, Norfolk and Suffolk NHS Foundation Trust, Hellesdon Hospital, Norwich NR6 5BE.
 Email: yasirmhm@yahoo.com

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Photo Quiz: Localized, reticulated erythema

Andrew A Lawson & Thomas C Michels

Abstract

A 70-year-old man presented in the winter with a four-week history of redness of the left anterolateral leg. On exam, the patient has an 8 cm, irregular patch of reticulated erythema with both hyperpigmentation and scaling. This manuscript contains the history and physical exam, a photo of the lesion, a differential diagnosis, and a discussion of management.

Keywords: Erythema ab igne, reticulated erythema, livedo reticularis, livedo racemosa, first-degree burn

Abbreviations: EAI - Erythema ab igne

A 70-year-old man presented in the winter with a four-week history of redness of the left anterolateral leg. He first noticed a slight “tenderness” in the area when showering; the discomfort lasted only a few days. Over the next week, he noticed redness developing. It is now painless and not pruritic, warm, or peeling. He has not applied any topical lotions or creams. He has not had an exposure to new soaps or detergents. He feels well, without fever or weight loss. He has a diagnosis of hypertension and lumbar radiculopathy with an L5 discectomy and resultant leg numbness. He is retired and does not smoke or drink alcohol; his hobby is woodworking in his garage.

Physical examination reveals normal vital signs. On his left anterolateral leg, he has an 8 cm, irregular patch of reticulated erythema with both hyperpigmentation and scaling. The lesion is non-palpable. He has decreased sensation in an L5 distribution on that leg, which was unchanged from prior examinations. These skin findings are shown in figure below.



Question: Based on history and physical examination, which of the following is the most likely diagnosis?

- Livedo reticularis
- Erythema ab igne
- Livedo racemosa
- First-degree burn

Discussion

The answer is erythema ab igne (EAI; literally “redness from fire,”) which results from chronic exposure to moderate-intensity heat. EAI presents as a reticulated erythematous patch over the area of exposed skin. Possible secondary changes include epidermal atrophy and scaling.^{1,2} With repeated exposure, brown hyperpigmentation may develop.¹ Most patients are asymptomatic, although some note a mild burning sensation. A history of repeated exposure to heat is key to the diagnosis. While cases were historically noted on skin exposed to fire, such as the arms of bakers and coal shovellers, EAI can result from our many, modern heat-sources, such as laptop computers, car seat heaters, heating pads, and, in this case, the portable space heater under the patient’s woodworking bench.²⁻⁴ With removal of the heat source, hyperpigmentation typically regresses but may take years.^{1,3} The diagnosis is clinical. A biopsy is not required to make the diagnosis, but is indicated if malignant transformation is suspected. EAI can increase risk of squamous cell carcinoma, Merkel cell carcinoma, and cutaneous marginal zone lymphoma.^{1,5} Treatment is typically not necessary; topical steroids or retinoids and laser have had variable success.^{1,3,4} If pre-malignant changes are detected, topical 5-fluorouracil is recommended.^{1,4}

See Table 1 for a summary of the key characteristics and distinguishing features of each diagnosis in this selected differential.

Table 1. Selected Differential Diagnosis of Reticulated Skin Lesions in Adults

Condition	Characteristics
Livedo reticularis	Violaceous mottled or reticulated patches; painless; typically temperature sensitive; may be physiologic or secondary to systemic disease; no hyperpigmentation.
Erythema ab igne	Erythematous reticulated patch, with possible secondary changes including epidermal atrophy and scaling; chronic exposure may lead to hyperpigmentation; painless or associated with a mild burning sensation; history of heat exposure.
Livedo racemosa	Violaceous reticulated patch with larger branching pattern than livedo reticularis, often with asymmetric or "broken" net appearance; typically involves the trunk and proximal limbs; generally secondary to chronic disease; frequently painful; no hyperpigmentation.
First-degree burn	Erythematous, dry, painful lesion which includes the entire area of skin that contacted the high-intensity heat source; not reticulated; no hyperpigmentation.

Livedo reticularis is typically more violaceous in appearance, with net-like, mottled discolouration of the skin due to deoxygenation and dilation of the venous plexus. Primary, physiologic livedo reticularis is often brought on by cold and alleviated by warming. It usually involves a larger area, such as the bilateral thighs, rather than a confined area of skin.^{1,2}

Livedo racemosa is a persistent variant of livedo reticularis with a characteristic, large, broken, branching pattern, often on the trunk and proximal limbs. It is generally secondary to a systemic disease, such as antiphospholipid antibody syndrome or Sneddon syndrome.⁶

First-degree burns are erythematous, dry, and painful. Instead of a reticulated pattern, as shown here, the erythema of first degree burns covers the entire area of skin that contacted the high-intensity heat source.

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Competing Interests

None declared

Author Details

ANDREW LAWSON, BS, 8253 Bagley Ave N., Seattle, WA 98103, USA. THOMAS MICHELS, MD, MPH, 1037 NE 65th St #80631, Seattle, WA 98115, USA.

CORRESPONDENCE: ANDREW LAWSON, 8253 Bagley Ave N., Seattle, WA 98103, USA

Email: aalawson@uw.edu

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