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Supportive Care Clinical Enquiry

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Abstract

Vascular Dementia is a progressive syndrome arising from cerebrovascular disease causing a disturbance in the flow of blood to the brain. This underlying pathophysiology manifests as difficulties with cognition, memory loss, language, executive function and psychological impairments. This paper will examine the experience of caring for Ivy (pseudonym), an 82 year old lady diagnosed with vascular dementia residing in a Launceston aged care facility. The discussion will explore the psychosocial aspects, pathophysiology, pharmacology and medical interventions surrounding vascular dementia and Ivy's care.

Supportive Care Clinical Enquiry

Vascular Dementia (VaD) is a progressive syndrome arising from cerebrovascular disease causing a disturbance in the flow of blood to the brain. This underlying pathophysiology manifests as difficulties with cognition, memory loss, language, executive function and psychological impairments. As such, VaD is a debilitating condition resulting in an individual's inability to maintain activities of daily living, social relationships and responsibilities. This paper will examine the experience of caring for Ivy (pseudonym), an 82 year old lady diagnosed with VaD residing in a Launceston aged care facility. The contents of this discussion are not intended to be a comprehensive chronology of care or a description of the multiple co-morbidities she experiences; but rather an exploration of the psychosocial aspects, pathophysiology, pharmacology and medical interventions surrounding VaD and Ivy's care. The paper will conclude with a description and rationale of nursing management focused on the most pertinent care provided to maintain her emotional health, physical health, personal care and dignity.

When I first saw Ivy I was unaware of her diagnosis or that she was one of the residents whose care I would be assigned to. She was sitting in a corner next to her walker quietly absorbed in her large print book, oblivious to the conversations and events around her. Her manner revealed a picture of detached calm, her affect appeared flat and she conveyed a sense of apathy towards her surroundings. I would never have guessed that Ivy has dementia or that her care needs place her in the category of level two bordering on level one; meaning that she is highly dependent on staff for even the most basic care. As Ivy experiences cognitive and communication difficulties related to her VaD, information regarding her

psychosocial circumstances was obtained from sparse conversations with her, the facility's records and a brief conversation with her daughter. I obtained consent for this paper from both Ivy and her daughter due to the fact that Ivy is currently considered legally incompetent to consent.

Ivy was diagnosed with VaD twelve years ago when she started to experience concentration difficulties and inability to organize and complete tasks. During a conversation with her daughter I learned that she was quite accepting of her diagnosis, read widely on the topic of VaD and visited many aged care facilities in anticipation of an impending admission. With the help of her doctor Ivy managed to reduce many of the factors that contribute to the development of VaD; she quit smoking, exercised regularly, amended her diet and managed to reduce her cholesterol. At the time of diagnosis Ivy resided in Launceston alone after moving from a rural farming community upon the death of her husband. As time went by she became incapable of attending to the things she placed value on such as her children and grandchildren, gardening, exercise and charitable work. Her daughter believes it was Ivy's inability to cope with social situations and her belief that she was rapidly losing her dignity that led to depression and withdrawal from the family. At this point her doctor and family intervened and Ivy moved into residential care.

Ivy's children and grandchildren visit her regularly and are very happy with the care she receives within the facility. The daughter I spoke with is a registered nurse (RN) who visits regularly to participate in diversional activities and is closely involved in Ivy's care. She is greatly relieved that Ivy no longer experiences the debilitating depression she once did. More than anything, she is grateful that Ivy is yet to display any of the overt behavioural disturbances so often associated with dementia; despite the cognitive difficulties Ivy experiences the family is not presented with the picture of someone they do not know when they visit.

The exact subtype of VaD Ivy suffers from is not known. There are many subtypes of VaD; each with a slightly different pathophysiological basis and often a definitive diagnosis can only be made with post-mortem studies (Adams, 1997). However blood vessel occlusion is recognised as the predominant cause of all VaD and it is usually a result of atherosclerotic growth (Kumar & Clark, 2006). Atherosclerosis begins with an inflammatory response after vascular endothelial cell damage. Smoking, hypertension and hyperlipidaemia are some of the risk factors for endothelial damage and atherosclerosis (McCance & Huether, 2002) present in Ivy's history. During the inflammatory response macrophages adhere to the endothelium and engulf low-density lipoprotein (LDL) circulating in the blood (McCance & Huether, 2002). A fatty streak is formed on the artery wall and smooth muscle cells proliferate and produce

collagen which forms a plaque covering the streak (McCance & Huether, 2002). Over time the smooth muscle cells die and are replaced by scar tissue and calcium salts (Marieb, 2004).

As a result of this process Ivy's blood vessels would be hardened and narrowed reducing the flow of blood to brain tissue. As the plaque continues to develop it may rupture initiating platelet aggregation resulting in thromboembolism (McCance & Huether, 2002). In VaD atherosclerosis or thromboembolism results in ischemia and as brain tissue is hypoperfused it may lead to multiple infarcts, lesions and atrophy (Gustavo, Roman, 2003b). The cumulative affects of the hypoperfusion and infarcts contribute to the progressive nature of VaD (Peretz, Cummings, 1988) In Ivy's case this is manifested in step-like deterioration as each ischemic event occurs.

White matter lesions are a common feature of VaD; they are due to neuronal demyelination and glial cell proliferation, and it is the extent and location of such lesions that are believed to produce mental changes (Strub, 2003). White matter is a collection of axons connecting cortical cells (O'Sullivan et al., 2001) so for Ivy the disruption of these neural pathways disconnects assorted areas of the brain resulting in cognitive decline. Additionally, damage to a very specific brain area can also produce focal deficits (Peretz & Cummings, 1988); this is evidenced by Ivy's history of Jacksonian seizures isolated to her left leg. Such seizures usually emanate from a lesion to the motor cortex of the brain and are not followed by lasting neurological deficits (Duus, 1983).

Subcortical infarctions are responsible for memory deficits (Duus, 1983) so it may be that Ivy's problems with short term memory result from occlusion of subcortical vessels. It is also believed that lesions disrupting subcortical pathways are responsible for the loss of executive function so common with VaD (Roman, 2003a). Ivy experiences a severe progressive loss of executive control as she has difficulty with goal directed planning, execution as well as behavioural and emotional supervision. This manifests as difficulties with activities such as dressing, personal care, activities of daily living, eating, mobilisation and toileting (Roman, 2003a); Ivy experiences all such difficulties. Her disorganised thoughts and emotions are consistent with emotional supervision difficulties. Such disorganisation is evident in the confusion and frustration she feels as she tries to communicate, as well as her previous history of depression, tendency towards apathy and flat affect.

It is believed that ischaemia caused by lesions is responsible for the acetylcholine deficits associated with VaD (Roman, 2003a). Cholinergic nerves are associated with cognitive and intellectual function, memory formation and motor control (Galbraith, Bullock, Manias, 2000). Therefore pharmacological

treatment of VaD sometimes involves acetylcholinesterase inhibitors (Brandt, 2001) to decrease the breakdown of acetylcholine in order to reduce cholinergic deficits (Australian Medicines Handbook Contributors, 2004). However, on consultation with Ivy's doctor I learned that he has based her treatment around treating the risk factors for vascular abnormalities which contribute to the development and progression of VaD. Therefore over the past years Ivy has ceased to smoke, her diet has been altered to such a point that she no longer has hyperlipidaemia and she continues to receive pharmacological treatment for hypertension.

To treat Ivy's hypertension she is prescribed 40 mg of frusemide daily. This loop diuretic inhibits sodium, potassium and water reabsorption in the ascending limb of the loop of Henle within the kidney nephron, thereby increasing diuresis (Tiziani, 2002). For Ivy this reduces blood volume as fluid leaves the vascular compartment; therefore total peripheral resistance is lowered subsequently reducing her systemic blood pressure. Hypertension increases thromboembolism risk and small vessel brain infarction which contribute to white matter abnormalities associated with VaD (Strub, 2003). Diuretic treatment is therefore important for Ivy because lowering her blood pressure reduces the chance of events leading to cerebral hypoperfusion which is the hallmark of VaD.

Loop diuretics inhibit potassium reabsorption potentially exposing an individual to hypokalaemia (Bryant et al., 2003) which adversely affects nerve and muscle transmission (Tiziani, 2002). This may induce arrhythmia, fatigue, paralysis, confusion, shallow respiration or cramp (Crisp & Taylor, 2005). Therefore to prevent hypokalaemia Ivy takes a 600mg slow release potassium chloride supplement daily to replace potassium lost due to the frusemide.

Ivy has been prescribed oxybutynin to treat her urge incontinence (UI); she experiences nocturnal enuresis therefore she takes 5mg nocte to reduce nightly incontinent episodes. Acetylcholine facilitates detrusor contraction leading to micturition (Bryant et al., 2003). The anticholinergic oxybutynin blocks acetylcholine binding at receptor sites on the detrusor muscle, reducing bladder contractility (Pharmacy Guild of Australia, 2004). Ivy's bladder will contract less frequently, allowing more complete filling which reduces the frequency she voids at night facilitating a comfortable and dryer sleep. Anticholinergics potentially cause a number of adverse effects, especially in the elderly who are often very sensitive to them (Bryant et al., 2003). These adverse effects include dry eyes and mouth and constipation. Confusion and impaired cognition (AMH, 2004) are two effects that can be particularly detrimental to those with dementia. Therefore while caring for Ivy I regularly monitored for such adverse effects.

On consultation with Ivy's doctor I learned that since commencing oxybutynin she is often constipated. Therefore she has been prescribed 2 daily coloxyl and senna 50mg/80mg tablets as well as microlax enema PRN when the coloxyl and senna is ineffective. The active ingredient in coloxyl is the faecal softening agent docusate (AMH, 2004). Docusate's emollient action breaks surface tension allowing water and fat to penetrate faeces; it also stimulates water secretion into the bowel (Bryant et al., 2003). Senna is a stimulant laxative which increases water and electrolyte secretion into the colon (AMH, 2004) and promotes peristalsis by stimulating colonic nerves (Bryant et al., 2003). For Ivy the net effect of coloxyl and senna is a softened stool and increased peristalsis making defecation easier and more regular. While caring for Ivy I monitored her bowel actions, maintained her bowel chart and assessed the need for a microlax enema. Microlax contains an emollient with a similar action to senna; it also contains sorbitol, an osmotic laxative (Tiziani, 2002). Sorbitol exerts an osmotic effect within the bowel which draws fluid into the lumen (Bryant et al., 2003). This distension stimulates peristaltic movement and Ivy defecates within 5-30 minutes after administration.

As Ivy has a long history of urinary tract infection (UTI) she takes 100mg of nitrofurantoin daily as a long term prophylactic measure against infection. It is a broad spectrum antibiotic, sensitive to a range of gram positive and negative bacteria responsible for lower UTIs (Australian Medicines Handbook, 2004). Nitrofurantoin interferes with bacterial protein, DNA, RNA and cell wall synthesis ultimately leading to bacterial death (Bryant et. al., 2003). This means bacterial growth sensitive to nitrofurantoin within Ivy's urinary tract will be inhibited reducing the likelihood of infection.

Due to the recurrent and asymptomatic nature of Ivy's UTI history, every quarter her doctor orders a midstream urine sample to be sent to pathology. In the laboratory the specimen is examined under the microscope, cultured and any pathogens are tested for antibiotic sensitivity (Lee & Bishop, 2002). The culture and microscopic examination allows a clinical picture to be built surrounding the presence of red, white and epithelial cells, as well as casts and bacteria indicative of infection. The sensitivity test determines the bacterial sensitivity to drug treatment (Gray, 2005). The pathology report allows Ivy's doctor to confirm infection and choose an antibiotic capable of destroying the bacteria responsible for the infection. In the past Ivy's infections were usually a result of *Escherichia coli*. This bacterium is a natural bowel flora and commonly causes UTI in elderly women due to proximity of the anus to the urethral opening and inadequate flushing of bacteria from the urethra due to incontinence (Crisp & Taylor, 2005).

When Ivy first started displaying symptoms consistent with Dementia her doctor ordered a non-contrast computed tomography (CT) scan. CT imaging coupled with health history, cognitive assessment, mental and physical examination allows physicians to distinguish between VaD and Alzheimer's disease (O'Brien & Barber, 2000). A CT scan consists of an x-ray beam which revolves around the person; detectors measure the beam's penetration amount and a computer analyses the findings to construct a cross-sectional image (Brown, 2004). Findings on Ivy's scan consistent with VaD include pronounced periventricular white matter lucency, enlarged ventricles as well as carotid and vertebral artery calcification. White matter lucency is indicative of chronic ischaemia associated with lesions and the calcification provides evidence of advanced vascular disease (Roman, 2003b). The diagnosis of VaD would then have allowed the doctor to educate Ivy and plan pharmacological treatment to minimise the progression of the disease and manage her symptoms. Likewise a diagnosis allows nursing staff to provide appropriate care and understand the likely progression of Ivy's physical and mental status.

The RNs at Ivy's age care facility have developed a comprehensive nursing plan which is reviewed and altered according to Ivy's care needs on a regular basis. Care plans identify goals and provide strategies and an evaluation process to ensure that people receive safe and optimal care (Sox, not dated). As such I consistently consulted Ivy's care plan over the course of my placement and documented care I provided and relevant events in her resident notes, bowel charts, medication charts and observational charts. Any documentation was then countersigned by an RN. Documentation is important because it provides a way to communicate information to staff, ensures continuity of care, displays accountability, assists quality assurance and allows funding to be maintained (Crisp & Taylor, 2005).

Ivy's care plan indicates that her communication is impaired due to deficits in cognition, eyesight and short term memory loss. In the initial days of caring for Ivy I sensed that she felt uncomfortable in my presence; she withdrew, seemed unwilling to converse and appeared apathetic. Such behaviour is common in VaD (Adams, 1997); people withdraw because they are unable to understand and therefore cope with a situation that is unfamiliar (Gorman, Raines, Sultan, 2002). I worked very hard to develop a trusting rapport with Ivy by utilising therapeutic communication skills in order to display empathy and kindness. I was mindful to include Ivy in all aspects of her care by explaining what I wished to do and asking for her consent. I was aware of the non-verbal cues and information I was displaying and attempted to provide a supportive stress free environment. According to best practice, I spoke calmly and slowly in short sentences and was mindful to appreciate and acknowledge Ivy as a valued human being (Anderson, 1995). However she still remained apathetic in a distant, smiling kind of way. I was

able to gain Ivy's trust and communication between us eventually improved as she ceased to withdraw quite as much, and caring for her became an easier and enjoyable experience.

Ivy's withdrawal from social situations has been ongoing since her admission to this aged care facility. Her doctor believes that she no longer suffers from depression; however she displays many characteristics consistent with depression. These characteristics include withdrawal, tendency towards weight loss, apathy and loss of pleasure in the things she previously found enjoyable (Gorman et al., 2002). Due to problems with cognition I was unable to complete a geriatric depression scale with Ivy so I sought instead to provide for her emotional needs and encourage socialisation. As emotional status is based heavily on one feeling validated as a person with a history and social connections (Lin, Dai, Hwang, 2003) I implemented reminiscence therapy into Ivy's day. We spoke about things she remembers and values from the past such as life on the farm and her connection with nature; I read her a contribution she made to a book about the people in her local area, and we sat in the garden and enjoyed the sunshine. As our rapport developed I was able to encourage Ivy's participation in activities organised by the diversional therapist and conversations with residents around the home.

During this placement I assisted Ivy with her personal care needs. I was mindful at all times to maintain her dignity and fostered independence (Godkin & Godkin, 2004) by encouraging her to perform the few tasks of which she is capable for herself. Personal hygiene is essential for a person's safety, physical and emotional wellbeing; it also provides an opportunity to assess skin and mucosal integument (Crisp & Taylor, 2005). Due to functional and executive planning deficits associated with dementia the nursing care needed to maintain Ivy's personal hygiene is extensive. Care provided for Ivy therefore included showering, oral care, perineal care, hair care and assessment of integument including feet. The assessment of integument is extremely important when caring for the elderly as their epithelium is often thinner, loses elasticity and healing is often slow due to multiple co-morbidities; this predisposes the elderly to tears, bruising and ulcers (Jarvis, 2004). Additionally people with dementia can not always isolate pain and discomfort or express this to caregivers (Volicer & Hurley, 2003). Therefore I thoroughly assessed Ivy's skin daily while bathing her and provided measures to maintain integrity such as proper drying, cornstarch to her abdominal folds and sorbelene to dry skin on her arms and legs.

Maintaining a dry perineal area free of urine and faeces is essential to maintaining comfort, dignity and skin integrity (Crisp & Taylor, 2005). I therefore ensured that Ivy's perineal care was performed meticulously and with sensitivity to the very private nature of this care. In order to discourage microbial colonisation often responsible for UTI, I attempted to keep Ivy dry, free from faeces and wiped from

front to back (Gulanick et al., 1990). In order to keep Ivy dry I toileted her soon after meals and administration of her diuretic and every two hours in between. I was mindful to monitor her behaviour for fidgeting or non-verbal cues suggesting the need to urinate or defecate; each day I asked her about pain on urination indicative of UTI.

Each week Ivy has a set of observations performed; blood pressure, pulse, respirations and temperature. Vital sign measurements are indicative of circulatory, respiratory, neural and endocrine effectiveness; alterations in these observations result from changes to physiological or psychological functioning (Crisp & Taylor, 2005). As such, each week I compared the results to previous findings in order to determine if they were within an acceptable range or if there was any changes warranting further investigation. Monitoring vital signs regularly is essential considering Ivy's history of UTI and the risk of cerebrovascular accidents associated with VaD.

In conclusion, VaD is a debilitating syndrome that leaves people requiring increasingly extensive amounts of care as it progress. People caring for those with VaD need to provide care that maintains the individual's comfort and dignity, validating them as a human being with a rich history and personal identity. During this placement I learned that identifying the needs of a person with VaD requires one to have comprehensive knowledge of the pathophysiology, pharmacology and psychosocial circumstances surrounding the individual. Only then can we provide care in such a way as to optimise that individual's health and well-being and maintain their quality of life.

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