A case study of anita brown nursing essay

During the last 15 years there has been a substantial rise in the number of newly diagnosed patients with acute kidney injury especially whilst an inpatient Yaklin, 2011. This is despite every effort to prevent AKI in clinical practice (Venkataraman, 2008). Anita Brown is one such patient, having been diagnosed with AKI following routine surgery. AKI occurring after surgery is associated with a significant increase in patient morbidity and mortality (Chertow, Levy, Hammermeister, Grover, Daley, 1998; Praught & Shlipak, 2005).

Here I will discuss the nursing management of Anita Brown over a 48 hours period. I will start by exploring the pathophysiology of AKI and identifying the type of injury Anita has sustained. Thereafter, in order to formulate an optimised, tailored 48-hour care plan, I will describe two different but complimentary assessment methods to identify Anita's priorities of care, namely the ABCDE framework (Resuscitation Council, 2010) and the Roper, Logan and Tierney (1980) model of nursing. The nursing interventions subsequently proposed will be justified in relation to Anita's pathophysiology and will be supported by professional literature. Finally, the findings will be incorporated into a 48-hour care plan based on six of Roper et al.'s activities of living (ALs) and a brief conclusion presented.

Background

Anita Brown is a 45-year old woman who has been diagnosed with AKI as a result of severe dehydration, following insufficient fluid administration during/after her cholecystectomy operation. Anita has been experiencing intractable vomiting despite receiving nil by mouth. She is borderline hypotensive, tachycardic and tacypnoeic and has been oliguric for 6 hours.

Current management includes fluid replacement. Anita's pain is being controlled by a patient controlled analgesia (PCA) pump of morphine.

Pathophysiology of Acute Renal Injury

AKI is an extremely complicated disorder (Martini, Nath & Bartholomew, 2011). The definition of AKI is a decline in the functions performed by the kidneys resulting in increased levels of serum creatinine and urea detectable in the blood (Dirkes, 2011). Indeed, the condition is most easily recognised by a rise in serum creatinine plus a decreasing urine volume, however, these symptoms are also accompanied by other physiological changes, as will be seen later (Guidelines and Audit Implementation Network [GAIN], 2010). There are three general categories of AKI (relative prevalence shown in parentheses): pre-renal (~55%), intrinsic (~30%) and post-renal (~15%) (Marieb, 2010).

Pre-renal kidney injury is the most common form and is generally reversible when renal perfusion pressure is swiftly restored. It has a number of causes, the most common being intravascular volume depletion (haemorrhage, dehydration, burns, gastrointestinal losses) or decreased cardiac output (myocardial infarction or cardiac arrhythmias) (Cheung, Ponnusamy, & Anderton, 2008), all leading to hypo-perfusion within the kidneys (Gotfried, Wiesen, Raina and Nally 2012). Drugs that are vasoactive can also cause pre-renal kidney injury (Barber & Robertson, 2009), since intra-renal vasoconstriction can ultimately lead to hypo-perfusion (Murphy & Byrne, 2010). Anita's surgery was complicated since the planned laparoscopic cholecystectomy had to proceed to an open cholecystectomy, thus she probably suffered considerable intra-operative fluid loss. If inadequate

replacement ensued, the reduced blood flow within Anita’s kidneys could have caused hypovolemic or cardiogenic shock (Garretson and Malberti, 2007). Indeed, inadequate intravascular volume arising from significant fluid/blood loss is a common cause of hypovolemic shock (Hand 2001, Bench 2004).

A further cause of AKI, intrinsic kidney injury, is associated with injuries that structurally harm vessels, the glomerulus, or kidney tubules (Ali & Gray-Vickrey, 2011). Prolonged or severe pre-renal hypoperfusion may lead to such injury through ischaemia. Alternatively, infectious elements or pollutants are a further cause of such damage (Murphy & Byrne, 2010). Notably, tubular cells within Anita’s kidneys would have been severely damaged if blood flow had been reduced to 20% of normal (Cheung et al., 2008), although the actual extent of her injury is currently unknown. This type of injury is termed acute tubular necrosis (ATN), and is a common reason for AKI in hospitilised patients (Ali & Gray-Vickrey, 2011). ATN is characterised by decreased consciousness, reduced urine output resulting from tubular damage, and nausea and vomiting. Like prerenal injury, ATN is often reversible, however, early intervention and distinguishing the mechanism of damage, whether prerenal or intrinsic, is vitally important to improve patient outcome (Gotfried et al. 2012).

Other less common causes of intrinsic injury are acute interstitial nephritis (AIN) arising from allergic drug reactions or systemic disease, and contrast-induced nephropathy (CIN) arising from toxicity associated with radiological contrast media administration (Fry, & Farrington, 2006; Hilton, 2011; Thomas, 2008). Risk factors for CIN in patents undergoing radio-contrast

include age and pre-existing renal impairment plus simultaneous administration of metformin to treat diabetes (Porth, 2007). Consequently, diabetic patients with renal impairment and taking metformin (a drug which is 100% renally excreted), when undergoing radio contrast should be closely monitored, and medication stopped 48 hours before and after the procedure (Royal College of Radiologists, 2009).

Finally, post-retinal kidney injury arises from urinary tract obstruction, the resultant back-pressure inhibiting glomerular filtration rate and causing ischemia (Leach, 2009; Hsu & Symons, 2010).

ABCDE Approach: Airway, Breathing, Circulation, Disability and Exposure

Nurses play a vital role in effectively managing acute-care patients such as Anita, with timely intervention resulting in the prevention of life-threatening complications (Clarke & Ketchell, 2011). The use of a systematic approach that identifies the priorities of care is essential (Thompson, 2008). Comprehensive Clinical Assessment Guidelines exist for AKI (Lewington & Kanagasundaram, 2011), which emphasise that it is essential to consider the underlying cause of AKI since certain origins, such as AIN, would need specialised therapy. Initial clinical orientation requires nurses to ensure that necessary tests are performed and relevant assessment/monitoring is undertaken swiftly (Henneman, Gawlinski, & Giuliano, 2012). Antia has already been diagnosed with AKI arising from insufficient fluid replacement during surgery, thus prerenal kidney injury has arisen from renal hypo-perfusion and ischemia, due to an inadequate intravascular volume. Although the extent of the damage remains to be seen, restoring

intravascular volume is key to Anita’s recovery. A useful approach in assessing and managing a patient who may deteriorate, such Anita, is the Airway, Breathing, Circulation, Disability, Exposure (ABCDE) approach (Resuscitation Council, 2010). This would be highly useful for Anita, as it would break down the complex assessment procedure for AKI into a systematic process, whereby assessment and treatment algorithms would allow provision of a prioritised care plan. The ABCDE framework also serves as a valuable tool in identifying/eliminating critical conditions (Thim, Krarup, Grove, Rohde, & Lofgren, 2012). Anita’s assessment will now be considered under the five separate headings.

Airway

The patency of Anita’s airway would be checked, to ensure there is no obstruction. Anita is overweight and upper airway obstruction through narrowing of the airways can occur in obese patients especially during sleep (sleep apnoea) (Hillman, Platt and Eastwood, 2003). If Anita’s PCA is causing sedation, she will be drowsy. Consideration should thus be given to providing adequate pillows to ensure her posture and positioning on the bed would be conducive to a patent airway, similar to a head-tilt and chin-lift position (Thim et al, 2012). Frequent repositioning would also guard against pressure sores.

Breathing

Assessment of Anita’s breathing involves respiration rate coupled with observations regarding whether her breathing is noisy, or laboured; movements of the thoracic wall and use of auxiliary muscles are clues to

look for (Thim et al., 2012). Assessing Anita's risk of post-operative sleep apnea would mean observing her when sleeping, and noting if she snores or is apnoeic (Thim et al., 2012). To alleviate such symptoms correct positioning would be vital, indeed it is known that poor positioning of obese patients in bed may impede lung expansion (Moore, 2007). Breathing difficulties could require oxygen administration or in severe cases, assisted ventilation (Thim et al., 2012). Anita's is slightly tacypnoeic (respiration rate= 22/min); this needs monitoring. Anita has endured severe dehydration and the underlying cause of the tacypnoea is probably related to the ensuing reduced circulating volume, which in turn causes a numbers of associated physiological changes including increased respiration rate (Large, 2005); other vital signs are also affected, as seen below.

Circulation

Anita is borderline hypotensive (BP= 105/60 mm/Hg) and slightly tachycardic (pulse= 108 beats/minute). The severe dehydration Anita has suffered means her heart tries to compensate for the reduced volume by pumping harder (increase in cardiac output) and faster (increased heart rate) (Large, 2005). Concurrently, the low fluid volume leads to a fall in BP. Consequently AKI-related dehydration, has resulted in adverse outcomes including hypotension, tachycardia, and tacypnoeic; weak pulse and cold hands and feet are further signs to look out for (Large, 2005). Additionally, level of mental status, dry oral mucous membranes, sunken eyes and reduced capillary refill/skin (or tongue) turgor are all secondary markers of dehydration (Merck Manuals, 2012) whilst ankle and sacral oedema are signs of fluid overload. Capillary refill time involves pressing on the pad of the

middle finger for five seconds then measuring the time for normal colour to return (Large, 2005). Skin turgor involves pinching a fold of skin and observing if it falls back to normal position immediately (Scales and Pilsworth, 2008).

Rapid restoral of Anita’s circulating volume is vital, with additionally the need for close and continuous monitoring of fluid levels (input vs output) and hemodynamics (Dirkes, 2011). Anita is nil by mouth and iv fluid input is being controlled at a rate of 1000mls dextrose/saline over 12 hours. Dextrose/saline is primarily used to replace water losses post-operatively. Normally fluid intake and loss are balanced (Scales and Pilsworth, 2008), yet Anita has been oliguric for 6 hours. Normal urine output is 1ml/kg body weight per hour, the minimum acceptable being 0. 5ml/kg/hr (Scales and Pilsworth, 2008). Thus Anita should have a minimum output of 50ml per hour. Obviously Anita is still suffering a fluid deficit. The kidneys can normally concentrate or dilute urine in response to fluid changes. If Anita’s kidneys are conserving water any urine excreted will be concentrated and dark (Scales and Pilsworth, 2008). The colour should be noted, in addition to the actual volume, on the fluid balance chart. Accurate records are critical in assessing Anita’s fluid balance. The level of iv fluid needed to restore Anita’s fluid balance depends upon an accurate assessment of her volume status, based on the following equation:

Fluid required = pre-existing deficit + normal maintenance + ongoing losses.

Fluid replacement calculations are challenging since Anita’s precise deficit is unknown, also her frequent vomiting represents a variable, on-going fluid

loss, which must be estimated and added to her maintenance fluid intake. A patient with a pre-existing deficit normally received rapid fluid resuscitation comprised of an initial large volume (~250ml) of iv saline, repeated as necessary. According to the Merck Manuals (2012) “ patients with intravascular volume depletion without shock can receive infusion at a controlled rate, typically 500 ml/h”. Anita’s fluid resuscitation status should be urgently established since Anita appears to be receiving maintenance fluids rather than rescue therapy. During Anita’s recovery phase her clinical response to iv fluids will guide the rate of fluid replacement, her vital signs and urine output should return to normal once normal hydration is achieved.

A urine output of > 0. 5 to 1 ml/kg/h is required (Scales and Pilsworth, 2008). But in addition to urine volume, monitoring electrolyte status is a further part of patient management in the recovery phase of AKI (UK Renal Association, 2011; Abdel-Kader and Palevsky, 2009). Urea, creatinine and sodium are elevated in volume-depleted individuals but to differing extents (Thomas, Tariq, Makhdomm, Haddad & Moinuddin, 2003). A full blood count is a further useful piece of information (Lewington & Kanagasundaram, 2011).

Disability

Anita’s state of consciousness has been evaluated through the Glasgow Coma Scale and is currently 15, indicating she is fully conscious and in no danger of disability pertaining to consciousness (Gabbe, Cameron, & Finch, 2003). Nevertheless, her mental alertness should continue to be monitored. Nurses need to ensure Anita can communicate adequately, especially since AKI can affect mental status because of hypernatremia, as a result of low

fluid volume. This happened because the vascular space becomes hypertonic and results in extracellular migration of water away from brain cells, hence accounting for neurologic symptoms (Lee, 2010). Also, Anita may be drowsy due to the morphine. Any mental status deficit should improve when Anita responds to treatment and stops opiate analgesia.

Anita’s repeated vomiting is disabling and is contributing to dehydration and electrolyte imbalances (Golembiewski, Chernin, and Chopra 2005; Gan, 2006), and clearly requires immediate attention. The underlying cause must be determined if appropriate interventions are to be used. Vomiting is common following anaesthesia, but is also linked to opioid treatment and also hypotension. There are a large number of drugs available to treat post-operative and opiate induced vomiting (Stevenson, 2006), however, Anita’s renal status means that administering antiemetic medications may be unwise. Anita is self-administering morphine, therefore the frequency of her usage, her level of pain control and alertness all need monitoring. In addition to sometimes causing sedation, nausea and vomiting, morphine can produce hypotension and respiratory depression, and obese patients, such as Anita, are at higher risk of these side effects. Therefore the risk/benefit of continuing PCA with this drug over nurse-controlled analgesia should be established; if continued Anita’s respiration rate should be frequently assessed and she should be monitored for signs of opiate toxicity.

Exposure

Anita’s wound must be checked regularly to ensure it is clean and there are no signs of opening or infection, especially given the trauma of her vomiting.

Surgical drains and urine drains likewise must be kept patent and clean; whilst regular temperature checks would monitor pyrexia.

The results of Anita's initial ABCDE assessment can now be put in to perspective by identifying key information to help devise her care plan through application of a second nursing framework.

The Roper, Logan and Tierney Model (1980) – Nursing Model and Care Plan

The Roper, Logan and Tierney model (1980) can be applied to the case of Anita Brown in order to devise a tailored care plan. This model takes a holistic approach and allows the impact of Anita's morbidities on her activities of living (ALs) to be considered. The model identifies twelve activities ALs namely eating and drinking, working and playing, sleeping, elimination, washing and dressing, communication, breathing, expressing sexuality held in relation to lifespan and the dependence/independence continuum. The framework is simplistic, yet provides a means to develop a logical and systematic care plan that is based on teamwork and mutual coordination (Murphy et al., 2000). It allows systematic collection of information from a patient's biological, physiological, sociocultural, environmental, and politico-economic, perspective (Roper, Logan, & Tierney, 2000). The model is especially applicable in patients requiring acute care such as Anita, helping to highlight the priorities of care that must be undertaken (Murphy et al., 2000). Once assessment is complete, a plan of care can be formulated which takes into account lifespan and level of dependence but may not necessarily cover all ALs (Beretta, 2003).

Here I will consider six of the most pertinent ALs which are relevant for Anita’s 48-hour care. I will highlight Anita’s problems in relation to the AL and describe the necessary nursing interventions and their goals as part of a 48-hour nursing care plan.

Safe Environment

Anita’s skin should be healthy and in tact: Check integrity of wound; Anita’s retching could rupture her stitches. Also check for infection or swelling following surgery using aseptic techniques. Record temperature regularly to ensure Anita remains apyrexial.

Anita’s vital signs are out of range: Closely monitor haemodynamic status, urinalysis and fluid balance status; these should be returned to normal through appropriate interventions. Check peripheral insertion line is patent, the fluid is running fast enough and the fluid is provided as prescribed. Accurately recording input (and output: see below).

Anita’s is vomiting: Anita’s vomiting will be distressing. Treat the underlying cause of the vomiting, and immediately adopt simple interventions to alleviate symptoms e. g. provide adequate bowls and tissues, open a window or provide a fan. Anita’s oral health may be compromised since she is vomiting and receiving nil by mouth. Offer assistance with oral hygiene.

Anita is self-administering morphine: The potential for unwanted opiate side effects warrants investigation regarding level of usage and pain control. Discuss this with Anita and switched to nurse controlled non-opiate analgesia is possible.

Breathing

Anita respiration should be 15-20/min: Anita is slightly tacypnoeic. Regularly monitor vital signs and observations post-operatively. Since Anita is overweight she may easily get out of breath during minor exertion so encourage her to ask for nursing assistance if she needs help.

Communication

Anita should be coherent and respond appropriately to questions: talk to Anita about how she is feeling and ensure her AKI, post-operative status and/or analgesia is not adversely affecting her mental abilities. Be aware of non-verbal transmission of information such as facial expression of pain/discomfort.

Elimination

Anita’s urine must be properly collected: regularly check the urine drainage bag and tubing to ensure patency and cleanliness and to record output. Similarly, if there is a wound drain in place.

Provide bedpan/commode: It is unlikely that Anita will need to open her bowels, however, she should be encouraged to seek assistance and request a bedpan/commode should she need one. Anita’s privacy and dignity must be respected throughout.

Sleeping

Anita may be sleepy: Anita may be drowsy from the morphine and want to sleep a lot. She is overweight, which may make her more prone to post-

operative sleep apnea. Observe her when sleeping for signs of snoring or apnoea. Anita’s posture and positioning on the bed is important, especially since she is at higher risk of pressure sores. Nurses would need to ensure Anita is not slumped but positioned in a semi-upright position and frequent repositioned.

Mobilisation

Anita must regain mobility: Anita is relatively young, but overweight which would hamper her everyday mobility. She should by encouraged to mobilise if possible such as assistance to a sitting position in a chair; this would reduce chances of post-operative thombosis.

All of these nursing actions have been formulated in a 48-hour care plan, a proposal for which is shown in the Appendix. Although relatively young, and presumably previous to surgery largely independent, Anita is currently considerably dependent on nursing staff for many ALs. This is reflected in her care plan. The ultimate aim of the Roper model is to achieve goals that promote independence in all ALs. Achieving this objective requires regular evaluation of Anita’s plan, which in turn requires accurate baseline data against which improvement or deterioration in her progress can be measured. The plan can then be adjusted accordingly (Holland, 2003).

Conclusion

Anita Brown has suffered AKI probably due to insufficient fluid replacement inter/post operation. The resultant drop in circulating volume has manifested in a number of adverse physiologic and haemodynamic events. Anita’s symptoms are consistent with pre-renal AKI (although ATN cannot be ruled

out (Cheung et al., 2008) necessitating swift intervention. The pathophysiology of AKI reveals that it is a multifaceted condition requiring complex clinical assessment (Lewington & Kanagasundaram, 2010). Here I have described a simplified, logical approach to Anita’s care, through the application of two systematic methodologies. The approaches advocated ensured all relevant assessments were performed and that appropriate and effective interventions were employed in the formulation Anita’s 48-hour care plan. The ABCDE mnemonic was used since it represents a strong clinical tool for rapid assessment and treatment of patients such as Anita requiring swift and effective interventions. Whilst the Roper, Logan and Tierney (1980) model provided a holistic approach to patient care since it allowed assessment of the patient “ as a whole” (O’Connor and Timmins, 2002), and has thus taken into account Anita’s specific needs and preferences, whilst ensuring she is treated appropriately (Clarke & Ketchell, 2011). Adhering to such tried and tested formulae allowed delivery of an optimised, tailored care plan, which will improve Anita’s prognosis and enhance overall outcomes.