Using subcutaneous fluids in end-of-life care

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Author Patricia Bowen is staff nurse; Alison Mansfield is ward sister; Helen King is clinical educator; all at Trinity Hospice, London.


There are currently no universally accepted medical or nursing guidelines for the administration of subcutaneous fluids at the end of life. Each case must be considered individually as it is unclear whether giving parenteral fluids to people who are dying causes, rather than alleviates, symptoms. This article discusses how to give fluids safely and suggests that relatives, who often feel very strongly about giving parenteral fluids, should be supported and involved in the decision making and care of their family member at the end of life.

When people are unable to take fluids orally those fluids can be administered artificially either intravenously or by infusion into the subcutaneous tissues, a process known as hypodermoclysis. Subcutaneous fluids can be given in this way to maintain hydration in patients who have mild to moderate dehydration. The procedure is relatively simple and involves inserting a butterfly needle into the subcutaneous layer of skin, where an extensive network of lymphatic and blood vessels allows the fluids to be readily absorbed (Mei and Auerhahn, 2009). This is the route most commonly used in palliative and end-of-life care settings.

Barton et al (2004) showed there was little difference between the rate of fluid absorption whether from the intravenous or subcutaneous route. There is a suggestion that the enzyme hyaluronidase can be used to increase absorption by temporarily increasing the permeability of subcutaneous tissue, but randomised studies have not shown any benefit from its use (Mei and Auerhahn, 2009).

Subcutaneous fluids have many advantages over IV infusions, including less discomfort to the patient, ease of administration and cost effectiveness (Doherty and Lister, 2011). They can also be administered in a range of settings including the patient’s own home (Lopez and Reyes-Ortiz, 2010).

Controversy about end-of-life hydration

Media coverage of the use of the Liverpool Care Pathway highlighted concerns by relatives about hydration at the end of life. This was also emphasised by Neuberger et al (2013), who suggested that not giving hydration caused more distress to patients and their families than the patients’ lack of ability or desire to eat. Lack of fluids was felt to add to suffering and cause people to die from dehydration. Relatives gave distressing evidence that the LCP had been badly implemented, with food and drink being withdrawn without discussion. This led to a suspicion from some relatives that withholding fluids was sometimes done to hasten death (Neuberger et al, 2013).

Schmidlin (2008) suggested that among health professionals there are different attitudes about the usefulness of artificial hydration at the end of life and these attitudes influence whether it is used. Cohen et al (2012) noted that the practice of hydrating patients who are terminally ill is more usual in acute hospital settings.
that hydration has benefits in some effusion. The authors of the review concluded that hydration caused more fluid retention symptoms such as pleural effusion. Another study found that better sedation was achieved in the group receiving assisted hydration; another found that hydration caused more fluid retention symptoms such as pleural effusion. The authors of the review concluded that there is moderate evidence that hydration has benefits in some patients but adverse effects or no effects in others.

A large study by Bruera et al (2013) compared hydration with a placebo and found strong evidence that there is no overall difference in survival, symptoms or quality of life. A qualitative study undertaken with the same group of patients and their families suggested that hydration had enhanced quality of life and comfort as perceived by the families (Cohen et al, 2012).

Prescribing subcutaneous fluids
Given the lack of evidence to support the use of subcutaneous fluids at the end of life, the General Medical Council (2010) has provided guidance that the risks and benefits of artificial hydration must be considered on an individual basis. The use of subcutaneous fluids is a medical treatment and should be offered when there will be an overall benefit to the patient.

Some indications for subcutaneous hydration are listed in Box 1, along with details of those situations in which it is not appropriate to administer subcutaneous fluids because they will have no benefit and may result in further deterioration.

Procedure
Before administering subcutaneous fluids, informed consent must be gained from the patient (Nursing and Midwifery Council, 2008). This may not be possible when patients are at the end of their life; in these situations, where there are families and carers, they must be involved in the decision-making process. A clear explanation of the potential positive and negative effects is vital to ensure they are able to give informed choice.

Once consent is gained, the prescription and administration rate need careful consideration. Amounts of fluid infused can range between 1,000ml and 2,000ml over a 24-hour period (Moriarty and Hudson, 2001). Normal saline is the crystalloid most often used.

Using a clean technique:
- Clean the skin according to local policy;
- Insert the butterfly needle into the skin at a 45-degree angle and cover with a sterile, transparent dressing (Dougherty and Lister, 2011);
- Ensure the line is primed before attaching it to the patient; and
- Attach the fluid bag and the administration set.

The most common sites for the butterfly needle to be inserted are the chest wall, abdomen and thigh. It is important to consider comfort and safety and whether the patient is still able to get out of bed or is in a confused state. It is recommended that some areas are avoided, including the following:
- Areas of ascites or lymphoedema;
- Areas of inflammation;
- Tumour sites;
- Close to broken skin; and
- Bony prominences.

It is essential to document the site, location, start time and the date of administration according to local policy. The infusion must be checked at regular intervals throughout the day and the patient should be encouraged to report any pain at the insertion site; the site should be rotated every 72 hours to reduce the risk of complications (Dickman et al, 2007).

Complications
The use of large volumes of fluid intravenously has been reported to show quicker deterioration in the condition of a patient who is terminal than it is to show symptom improvements (Morita et al, 2004). The study also showed that, in patients with lung and gastric cancer, the symptoms of fluid retention and distressing bronchial secretions reduced when the fluid volume being infused was decreased. Looking at subcutaneous fluid administration, Torres-Vigil et al (2012), similarly noted that the risks of fluid infusion can outweigh any benefits. If subcutaneous fluids are commenced, they need to be reviewed every 24 hours to check whether there is any benefit to the patient.

An increase in fluid volume at the end of life can overload the circulatory system and result in pulmonary oedema and increased respiratory secretions. An increased urine output can also prove distressing for patients who are dying and may struggle to get out of bed to use...
Normal saline is the crystalloid most often used for subcutaneous infusion

the toilet or sit on a bedpan, leading to further medical interventions – such as catheterisation – to maintain their comfort and dignity (Watson et al, 2011).

Localised side-effects of subcutaneous administration include pain, bruising, redness and local inflammation around the butterfly needle (Doherty and Lister, 2011). “Pooling” of fluids in the surrounding tissues can lead to localised oedema so the infusion site should be checked every four hours to ensure fluid is being absorbed. The infusion rate should be no more than 1ml/minute to reduce the risk of this.

Training and education

The GMC (2010) guidance states that before artificial hydration is used in patients at the end of life, each case must be looked at individually and the decision taken in the best interests of the patient, with consideration given to the wishes of their family. Neuberger et al (2013) point out that GMC guidance is not always followed and recommend that royal colleges review the efficacy of their training in shared decision making; they also recommend the NMC ensures nurses maintain their competence via continuing professional development.

The Leadership Alliance for the Care of Dying People (2014) emphasises the importance of education: “which must have the effect that registered nurses must be able to assess and monitor nutritional and fluid status... identifying signs of dehydration and acting appropriately to address these.”

The need for continuing education is demonstrated by Stockdale (2013) who surveyed 50 junior doctors and found 20% thought withholding hydration sped up the time to death, while 30% thought it improved survival and so prolonged suffering. It was also found that specific discussions with relatives about fluids at the end of life were neglected, with only 5% of patients having documented records of these conversations.

To be able to discuss this emotive issue with patients and families, health professionals should be aware of the latest evidence so they can give them the correct information. Training in communication skills is also essential to ensure that any conversations that are had are handled sensitively and empathetically.

Mouth care

Education should focus on other aspects of symptom control that can alleviate patients’ symptoms, such as mouth care. A dry mouth is often caused by mouth breathing and medication, and will not be alleviated by artificial hydration (National Council for Palliative Care, 2007). Regular oral care to maintain a moist, comfortable mouth and alleviate any thirst is an essential part of care at the end of life. This care can be given by family members, who often gain great comfort from having a practical role to play. The use of crushed ice and saliva spray has also been found to be beneficial (Prevost and Grach, 2012).

Conclusion

No clear evidence is available to support blanket recommendations for using subcutaneous fluids at the end of life, and each case must be considered on an individual basis. Where such fluids are used, careful monitoring of the site is crucial with 24-hourly reviews of the patient’s condition. The views of patients’ families must be taken into consideration but subcutaneous infusions are a medical treatment and should only be given if considered by the multidisciplinary team to be in the patient’s best interests. Expert, holistic end-of-life care must be given regardless of whether or not subcutaneous fluids are administered.


General Medical Council (2010) Treatment and Care Towards the End of Life: Good Practice in Decision Making. tinyurl.com/GMCEndofLifeCare


Leadership Alliance for the Care of Dying People (2014) One Chance to Get It Right: Improving People’s Experience of Care in the Last Few Days and Hours of Life. tinyurl.com/EoLCOneChance


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