Managing malodour in palliative care wounds in primary care

Malodorous wounds are very distressing for patients and carers. Odour may be a sign of infection in some wounds but it is also one of the most distressing symptoms of malignant fungating wounds. It can cause social isolation, depression, nausea, anorexia and in some cases is so distressing as to cause a gagging or vomiting reflex. This paper will explore the causes of malodour with particular reference to palliative care wounds. It will also highlight its effect on individuals and present some strategies to manage or control it.

Prevalence
The World Health Organisation estimates that 10.9 million new cases of cancer are diagnosed annually (WHO, 2009). In Ireland, the national cancer forum reports almost 20,000 new cases each year (NCF, 2006). Cancer is a major cause of morbidity and worldwide accounted for 7.4 million deaths in 2004 (WHO, 2009). This is expected to increase to 12 million by 2030 (WHO, 2009).

Cancer is a generic term for a large group of diseases that can affect any part of the body (WHO, 2009). One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs. This process is referred to as metastases, which are the major cause of death from cancer (WHO, 2009). While there are no precise figures for fungating wounds it is estimated that of those persons with metastatic disease, approximately 5-10% experience skin involvement which usually occurs during the last 6-12 months of life (Lo et al, 2006). Of those with skin involvement and specifically, malignant fungating wounds (MFW), approximately 62% originate from breast cancer, followed by head and neck 24%, genitals and back 3% and other sites 8% (Naylor, 2002).

Fungating refers to a malignant process of both ulcerating and proliferative growth. Lesions that have a predominantly proliferative growth pattern may develop into a nodular ‘fungus’ or ‘cauliflower’ shaped lesion, whereas a lesion that is ulcerating will produce a wound with a crater-like appearance (Grocott, 1995). Some lesions present with a mixed appearance of both proliferating and ulcerating areas.

Quality of life
Palliative care focuses on relieving suffering and achieving the best possible quality of life for patients and their care providers. Optimal palliative care services integrate the expertise of a team of providers from different disciplines to address the complex needs of seriously ill patients and their families. According to Grocott (2010) palliative wound care is essentially concerned with improving quality of life and one of the key goals is to prevent wounds inhibiting patients’ and families’ day-to-day functioning.

Unfortunately, persons with malignant fungating lesions often present late seeking help (Boon et al, 2000). It is speculated that this may be due to embarrassment about appearance such as exudate leakage or due to a fear of being...
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diagnosed with cancer (Probst, 2010). Such wounds have enormous psychological impact on the quality of life of the individual causing embarrassment, social isolation, withdrawal from daily activities, poor self esteem, and all at a time when support is much needed (Lund-Nielsen et al, 2005; Lo et al, 2008; Probst et al, 2009). Malodour which is cited as being one of the most distressing features of such wounds has also been the cause of involuntary gagging and vomiting (Draper, 2005).

A study by Lo et al (2008) reported that in the absence of specialist knowledge about the management of fungating wounds, some patients report engaging in a variety of strategies to manage the wound, including: restricting water intake, using toilet paper to cover the wound, brushing using a baby toothbrush and herbal remedies.

**CAUSES OF ODOUR**

Wound malodour is caused by bacterial infection in devitalized tissue within the wound. More specifically it is due to a cocktail of volatile agents that includes short chain organic acids, produced by anaerobic bacteria (Moss et al, 1974), together with a mixture of amines and diamines such as cadaverine and putrescine that are produced by the metabolic processes of other proteolytic bacteria (Thomas et al, 1998).

Organisms frequently isolated from malodorous wounds include anaerobes such as bacteroides and Clostridium species and aerobic bacteria including Proteus, Klebsiella and *Pseudomonas* spp. (Thomas et al, 1998). More recently, a study to determine the chemical identity of the cancer derived-wound odour among women with breast cancer identified dimethyl trisulfide (DMTS), as the source of odour (Shirasu et al, 2009). DMTS is a compound that is known to be emitted from some vegetables and micro-organisms and is also produced by aerobes such as *Pseudomonas aeruginosa* (Shirasu et al, 2009).

Dead and devitalized tissue also causes wound malodour and provides an ideal environment for bacterial proliferation which in turn contributes to odour. Together with exudate production, all serve to increase odour. Furthermore, fungating lesions are thought to interfere with tissue oxygenation, lymphatic drainage and haemostasis and reduced tissue perfusion, due to abnormalities in the vascularisation of solid tumors, lead to local cell anoxia and sometimes cell death and tissue necrosis (Hirst, 1992; Cited in Adderley and Smith, 2010).

**MANAGING ODOUR**

Wound malodour is not an isolated phenomenon and thus, treatment strategies should attempt to address the cause of the odour and management of it. There is a paucity of clinical research studies which have evaluated strategies for the management of wound malodour. This may be due in part to the difficulties surrounding quantifying something which cannot be seen or touched or measured. One study demonstrated that of all wound assessment parameters the inter-rater reliability of wound odour was very poor (Gethin and Cowman, 2007). Strategies to manage malodour can be divided into two categories: wound management agents and environmental agents.

**WOUND MANAGEMENT AGENTS**

*Flagyl*

Metronidazole (Flagyl) is an antibiotic agent used topically or systemically for reduction of malodour and is particularly effective for anaerobic bacteria and protozoa. While used extensively there are variations in the concentrations used and the methods of application. Metronidazole tablets have been crushed and mixed with sterile water to create either a 0.5% solution (Smg/cc) or 1% solution (Seaman, 2006). This is then used as a wound irrigant or alternatively gauze is soaked in the solution and applied to the wounds. There is much anecdotal evidence to support this practice although little scientific evidence exists. It is also used as a gel at a concentration of 0.75% (Kalinski et al 2005). Research has shown a statistically significant (p<0.05) decrease in wound odour after 24 hours, as determined by both patient and investigator (Kalinski et al 2005). This statistical difference was maintained through days 7 and 14. Importantly, this method of application has not been associated with any pain or discomfort for the patient.

In a study of eleven patients with fungating wounds Bowler et al (1992) evaluated the efficacy of metronidazole gel on wound odour. Patients received either 0.8% gel or placebo applied daily for six days. Odour was measured using a ten point visual analogue scale In the placebo group (n=5), the average odour assessment remained above six. In the treatment group the mean odour scores showed a statistically significant reduction over the six days (p> 0.01).

*Honey*

Honey has been reported to effectively reduce and even eradicate odour as a result of the preferential metabolism by bacteria of honey’s glucose, which produces lactic acid, instead of amino acids that produce malodorous ammonia, amines and sulfur compounds (White and Molan, 2005). Honey and in particular Manuka honey has been reported to eliminate wound odour in fungating and non-fungating lesions (Gethin and Cowman, 2009; Simon et al, 2009; Moore, 2010; Segovia, 2010). As honey also has...
antimicrobial and debriding properties it is particularly useful, as it assists in eliminating those elements which cause the odour initially, namely, slough and bacteria (Gethin and Cowman, 2009). As an antibacterial agent it has demonstrated efficacy against a wide range of wound colonising pathogens (Cooper and Molan, 1999; Gethin and Cowman, 2008). It has anti-inflammatory properties which can assist in reducing exudate production (Molan, 2002).

A systematic review of the use of honey in cancer care concluded that honey may be used for radiation-induced mucositis, radiotherapy-induced skin reactions, hand and foot skin reactions in chemotherapy patients and for oral cavity and external surgical wounds (Bardy et al, 2008). The authors suggest that there is further scope for the use of honey within the cancer setting and particularly in the care of head and neck cancer patients.

Many formulations of honey exist but for the malignant fungating wound it can be applied either directly as a gel or in alginate dressings impregnated with honey. Frequency of application should be based on levels of exudate and the efficacy of treatment. In order to maximize its potential, honey should be in close contact with the wound surface for at least 12 hours, although if levels of exudate are small it can be left in place for up to seven days (Gethin and Cowman, 2009). It is worth nothing that not all honeys are suitable for use in open wounds and clinicians should restrict their use to licensed medical grade honey.

Charcoal
A systematic review reported that activated charcoal dressings applied to fungating wounds significantly controlled odour if the dressings fit as a sealed unit and if the wound was maintained dry (Draper, 2005). If not sealed the odour can escape. This is a problem in management of fungating wounds in which the peri-wound skin is often very sensitive and is not amenable to the use of adhesives. Activated charcoal dressings absorb toxins, as well as pro-inflammatory endogenous and exogenous proteases (Wound Care Handbook, 2010). The use of a charcoal cloth for management of odour has been incorporated into pads containing surgical gauze and a layer of a water repellent fabric. When these pads were used in the treatment of fungating breast cancer, gangrene and immediate post operative colostomies, the associated odours were said to be totally suppressed (Thomas et al, 1998). According to Thomas et al (1998) charcoal dressings which combine a physical absorbent with a charcoal component performs best.

One study of the management of malignant lesions reported a reduction in malodour by both patients and investigators when wounds were cleansed and either charcoal applied directly to the wound surface or as a secondary dressing when hydrogel was used to deslough the wound bed (Lund-Nielsen et al, 2005). The use of charcoal dressing in combination with a foam dressing with an adhesive border made the patients in that study feel protected against malodour and encouraged them to resume social activities (Lund-Nielsen et al, 2005). Given the variations in composition of dressings containing charcoal the manufacturer’s instructions should be consulted prior to use for optimal performance.

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AROMATHERAPY AGENTS
An interesting report by Mercier and Knevitt (2005) shares their experience of using aromatherapy in patients with fungating lesions. The choice of essential oil is decided by the patient in consultation with the staff member. If odour is only present during dressing changes the oil may be vaporized in the room before and during the procedure. When the odour is detectable outside of dressing changes a few drops are applied to the outer dressing. Some oils are then used in the cleaning of the wound such as tea tree oil. Oils are also blended into a cream and applied directly to the wound. It is recommended that such practices should be discussed with a pharmacist who is assess the safety of particular oils for use in patient care.

The use of green tea bags has also been explored (Yian, 2005). The author of this paper reports on the application of green tea bags as a secondary dressing. The bags help to absorb exudate and the antioxidants in the green tea act as a deodorizer. Further research is required to explore this option further but it may offer an interesting option for some patients.

ENVIRONMENTAL AGENTS
Wound odours have traditionally been masked by burning incense and in more recent times, by the use of aerosols or air fresheners. While there is a abundance of ‘retail’ products aimed at eliminating odour these are often perfumed and are poorly tolerated by persons with cancer.

Much anecdotal evidence exists for various environmental strategies including burning of oils which can create a pleasant aroma, in particular dried sage may be helpful. Other oils such as eucalyptus or clove oil can be beneficial. However, caution should be exercised in over-use as the strong odour may in itself be distressing.

Placing charcoal or cat litter in an open tray under a bed can assist in absorbing odours. Additionally an open dish of coffee beans or shaving cream in a room is said to be very effective. General environmental control strategies such as removal of soiled linen or open bins can also make an atmosphere more pleasant and enhance the patient’s surroundings.

Conclusion
Odour caused by wounds can be distressing for both the patient and the caregiver and may be a reminder of their underlying disease process. Odour can cause the patient to feel embarrassed or ashamed, and may lead them to become isolated and withdraw from their daily activities. Effective management should be based on reduction in slough, control of bacteria and can include a number of topical or environmental agents including charcoal, iodine, honey or Flagyl.
Unfortunately, persons with malignant fungating lesions often present late seeking help...this may be due to embarrassment about appearance ...or fear of being diagnosed with cancer.

References