

Control Malodor of Malignant Fungating Wounds in Advanced Cancer: A review

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Abstract

Background: malodor of malignant fungating wound is one of the most distressing symptoms which can affect the physical, psychological and social well-being of cancer patients. Therefore control of this symptom is a very important aspect to the palliative nursing role.

Purpose: to review and analyze the recent research articles that studied interventions and most current practices to control malodor of malignant wounds.

Method: literature review conducted using the electronic databases of CINAHL, SCIENCE DIRECT, PubMed, in addition to Google scholar engine for research articles published between 2010 and 2014. Twenty six published studies were reviewed; of these 6 articles were duplicated studies, and nine articles refer to managing malodor in general wounds not specific for malignant fungating wound were excluded. Eleven articles were reviewed and analyzed.

Findings: charcoal, silver, and topical metronidazole, in addition to the use of normal saline 0.9% to clean the wound and the application of highly absorbent dressings, were the most current practices used to control the malodor of malignant fungating wounds.

Conclusion: of the 11 studies which fulfilled the inclusion criteria, various interventions were undertaken. Most of the studies focused on the importance of using dressings and agents to contain exudate and wash out bacteria and necrotizing tissue, thereby aiding in the reduction of infection and malodor. Regardless of the findings of this search, there is still a lack of evidence base for standard care guidelines for this condition. Therefore, further research studies are required to help build a stronger evidence base and guidelines regarding of control malodor for malignant wounds.

Keywords: *management, fungating wounds, malignant fungating wound, tumor wound, and malodor*

Introduction

A malignant fungating wound (MFW) is a mass of malignant cells that has infiltrated the epithelium and broken through the skin surface, often in the shape of fungus or cauliflower. Such wounds are most likely to occur in the terminal stages of cancer, especially of the breast, head, or neck (Adderley, 2010). It can result from primary tumors of the skin such as squamous cell carcinoma, or from penetration of near cancer cells in the epithelium, such as in breast cancer, or accidentally from implantation of cancer cells in the skin through diagnostic or therapeutics interventions (da Costa Santos et al., 2010). Malignant fungating wounds (MFWs) occur in approximately 5% of patients with cancer and in 10% with metastatic disease. Malignant necrotic lesions increase the likelihood of bacterial infections which can cause a negative physical impact and diminished quality of life for patients due to malodor, profuse exudates, localized pain, bleeding and local infection. These conditions also bear considerable additional treatment costs (Lo & Huang, 2010).

Malodor is one of the most distressing symptoms of fungating wounds because it can have a negative effect on the psychological status of the patient and may cause depression, social isolation, loss of appetite, nausea and vomiting. Microorganisms and necrotizing tissues with reduce tissue perfusion, lymphatic drainage and excretions of exudate provide an ideal environment for bacterial colonization which leads to increased malodor (Gethin, 2011). Due to the complicated healing process for such types of wounds, symptoms control of malignant fungating wounds is the main focus of wound care approach. Wound care may also have a significant influence on patient comfort as it can reduce and alleviate symptoms such as pain, bleeding, exudate and malodor, and thereby can aid in increasing quality of life for these patients (Merz et al., 2011). Various types of therapeutic interventions are used to control malodor of fungating wounds, but still there are no clear standard guidelines to assist

care providers in the palliation of symptoms and enhancement of optimal patient comfort (Adderley, 2010).

Controlling malodor of malignant fungating wounds is a challenge for health care providers and family members. Treatment of MFWs is complex and requires an appropriate treatment plan based on a holistic assessment of the patient to control the symptoms of fungating wounds (da Costa Santos et al., 2010). The purpose of this search was to review the research literature regarding current practices used to control malodor and to subsequently develop best practice guidelines to manage and control MFWs malodor.

Theoretical framework

Levin's conservation model provides an attentive groundwork for applying effective wound care to enhance the healing process of fungating wounds, and thereby improve human wellbeing and quality of life (Matthew, 2006). Through conservation, an individual is able to tackle obstacles and adapt accordingly for keeping the wholeness together. The four principles of conservation model are; conservation of energy, conservation of structure integrity, conservation of personal integrity, and conservation of social integrity. These conservations are the basis for the search guide (Levin's, 1991).

Principles of conservation model

Energy conservation is based on the faith that patient activity is dependent on energy balance, energy demand increase with disease, and that can be measured by the level of fatigue. Rest and adequate nutrition, utilize the principle of conserving energy, nurses can conserve patient's energy through reducing duration time of malignant wound management.

Structure integrity of an organ is connected with function integrity of this organ, to regain structure and function, the body needs to restore structural integrity through repairing and healing, and therefor managing wound and healing process of the wound is an actual example of conserving structure integrity.

Conserving personal integrity is constructed on the belief that person require privacy, self-identity, independency and autonomy, hospitalization for wound dressing compromise personal integrity. If the nurses are able to conserve energy and structure integrity, personal integrity will be conserved.

Conserving social integrity is based on the proposition that individual life has sense only in the perspective of social life, personal behavior is influenced by social relationship, wound malodor have a negative psychological impact on patients and families; embarrassment, social isolation often are associated of these patients, therefor nursing interventions to control malodor is an actual trial to conserve social integrity.

In conclusion, Levine's conservation model offers a considerate foundation for making effective wound management choices in order to improve wound healing and as a result enhance personal wellbeing and quality of life.

Methodology

A comprehensive literature review was conducted using the electronic data bases of PUBMED, CINAHL, and SCIANCE DIRECT, in addition to scholar Google engine published from 2010 to 2014. The scoping of literature review focused specifically on studies dealing with control of malodor, and management of malignant fungating wounds in general. The following key words were used to search the electronic databases; *management, fungating wounds, malignant fungating wound, tumor wound, and malodor*. The key words were used in different combinations to conduct an extensive search of the electronic databases.

Twenty six published studies were reviewed; of these 6 articles were duplicated studies, and nine studies refer to managing malodor in general wounds not specific for malignant fungating wound were excluded, eleven published articles achieved the inclusion criteria for the purpose of this search. The inclusion criteria were:

- (1) Research based articles.
- (2) Written in English language.
- (3) Published from 2010 to 2014.
- (4) Investigated management and control of malodor in malignant fungating wounds.

The eleven selected studies were quantitative; descriptive and experimental. The total number of patients across in these eleven articles was 485 patients with cancer ranged from one to 164 patients.

Pathophysiology

Malignant fungating wound is a chronic ulcer, which is often irreversible, arising from primary skin cancer, or due to infiltration of tumor cells from near tumor, or a secondary metastasis of cancer cells through the lymphatic or blood system (Sopata et al., 2013). Malodor may have multifactorial causes such as: colonization of bacteria, combinations of cadaverin and putrescence that result from proteolytics of bacteria, accumulation of exudate, and presence of necrotic tissue due to poor vascular perfusion (Gethin et al., 2014). According to a study of Gethin (2011) the presence of dimethyl trisulfide (DMTS) and necrotizing tissue with exudate are the sources of malodor of malignant wounds.

Findings

In order to develop an evidence base practice to control malodor of fungating wound, articles were reviewed from 2010 to 2014. The results of these studies reviewed assessed to determine the best practices to control fungating wound malodor.

Gethin et al, (2014) conducted an international survey, which included 36 countries to identify the routine practice used to control malodor of fungation wound; the sample population that included in this on line survey was health care professionals in wound care. 48%, 23% of 1444 respondents respectively indicate that charcoal dressing and silver

dressing were the most frequent agents used to control malodor and reported that were very effective. A further 8% indicated that aromatherapy oils were used to control malodor and 74% used combinations of agents to control odor. Respondents also indicated that antimicrobial agents were the most effective to control malodor but not the most frequently used. In order to develop best practice, 89% of respondents indicated the need to develop guidelines to control malodor of fungating wounds.

Adderley and Holt, (2014) reviewed four randomized control studies between 1992 and 2012 focusing on of the most effective dressings to manage the symptoms of fungating wounds, the results indicated that there is weak evidence regarding the effective use of foam silver dressing in reducing malodor.

Fromantin et al. (2014) indicated in their prospective descriptive cohort study on 32 patients with breast cancer that the efficacy of charcoal dressing is related to two factors: type of bacteria, and quantity of germ. Charcoal dressing was demonstrated to be more effective if the bacteria count was less than 10⁵/g and if there were no anaerobic bacteria colonized in the wound. Therefore, there was no significant reduction in malodor if anaerobic pathogens were present.

Sopata1 et al, (2013) found in a pilot study among 30 patients with malignant wounds that use scheme therapy presented in rinsing wound three time per day with normal saline 0.9% and cover wound with non-adhesive silicon NA dressing and gauze saturated with octenidine dehydrochloride covered by absorbent zetuvit and fixed by adhesive plaster on healthy skin is efficient and effective in treatment of all patients. Octenidine is effective against gram positive and gram negative bacteria.

Merz et al. (2011) indicated in their clinical review that crushed tablets of activated charcoal have a highly effective property against malodor. Silver and metronidazole inhibited

microbial growth, therefore decreasing malodor. Honey and chlorophyll dressing were also shown to be effective in reducing malodor.

Walsh, Bradley, and Cavallito, (2014) found in their case study of women with cutaneous melanoma stage three that odor may be controlled by these stepped interventions; clean the wound with normal saline 0.9% to wash out bacteria, apply high absorbent antimicrobial dressings to contain the exudate and to prevent infection, apply a specific dressing against malodor such as charcoal or metronidazole dressings, and undertake some environmental interventions such as the use of peppermint oil or an open container of charcoal, kitty litter, or coffee grounds under the bed.

Gozzo et al., (2014) indicated in their retrospective cross sectional study of 62 patients with breast cancer and fungating wounds, that charcoal and metronidazole, in addition to proper wound care by normal saline 0.9% and remove of exudate and necrotizing tissues, aided malodor control of fungating wound.

Gethin's (2011) clinical review found that effective malodor control should be based on elimination of necrotizing tissues, inhibition of infection, reduction of exudates and use of antimicrobial agents, such as charcoal, metronidazole and honey. Furthermore, the review indicated that use of environmental agents is important, such as put charcoal, coffee, and cat litter under the patient's bed as these help to absorb bad smells.

In India, Udawadia (2011) retrospective study from 2006 to 2009 indicated that a combination of honey and ghee was effective in controlling malodor for 8 patients with malignant fungating wounds. This combination has a bactericidal effect, digests sloughing tissue, deodorizes, and enhances granulation. In addition this aids in moist wound care and is available at a low cost combination making this a significant approach in developing countries.

Lund-Nielsen et al. (2011) in their prospective randomized control study of 69 patients with MFWs compared two interventional groups. Group A were treated with a honey-coated bandage and group B with silver-coated bandages. The results indicated a significant reduction in malodor for both groups (p -value = 0.007) and no significant difference between the two groups (p = 0.862).

Da Costa Santos et al. (2010) reviewed 20 studies to assess the evidence base practice used to control malodor of fungating wounds, they found that metronidazole, Mesalt dressing, activated carbon dressing, and curcumin dressing could be categorized as grade B evidence. Topical arsenic trioxide, essential oils, green tea extract, and hydropolymer dressings were rated as grade C evidence. Antiseptic solutions hydrogels and debridement enzymes were rated as grade D evidence.

Wound care recommendations

The philosophy of palliative wound care is based on symptoms control by providing comfort interventions that aim to decrease suffering of patients as well as preserve dignity of the patients in order to improve the overall quality of life. The following recommendations may help in carrying out this philosophy of palliative wound care:

Recommended interventions	Rational
Proper assessment of the wound by using a valid tool which cover all characteristics of a wound	To be able to build a treatment plan and to measure the effect of treatment
Clean wound with physiological normal saline 0.9% at the appropriate temperature.	To wash out bacteria in order to prevent colonization of bacteria to avoid infection
Gentle debridement of necrotizing tissue	To decrease chance of infection and to enhance granulation of normal tissue
Apply high absorbent dressings such as foam, hydrofiber, and alginate.	Help in containing exudate to prevent leakage of exudate outside of dressing.

Use most effective broad spectrum antimicrobial agents such as Octenidine	To prevent colonization of bacteria that lead to prevent infection and malodor.
Apply most effective agents in reducing malodor like charcoal, topical metronidazole, and silver.	Prevent malodor that help in improving quality of life
Keep moist dressing and protect periwound with barrier ointment	To avoid periwound infection and bleeding when changing a dressing
Change dressing daily or PRN	To get better results of wound care
Apply environmental agents such as placed charcoal under the bed, or peppermint oil	To encourage relatives to stay with their patients that will lead to prevent feeling of embarrassment and social isolation.
Apply menthol ointment on nostrils of patients	Help patients to experience good smell rather than bad smell that lead to improvement of psychological status.

Conclusion

This review of the research literature should be aid in the assessment of the best practice to control malodor of MFWs. Numerous interventions were used but still there is lack of evidence based practice in the control of malodor. Malodor is considered to be one of the most distressing symptoms experienced by patients with malignant wounds and therefor symptom control is very important as it will effectively contribute in an enhancing patients comfort. Among all studies mentioned in this review charcoal, silver and topical metronidazole dressings in addition to proper wound care were the most common products and practices used effectively in reduction of malodor. Further studies are needed to develop an appropriate assessment tool and best evidence based practice in the control of malodor

specifically. And other symptoms associated with fungating wounds such as pain, bleeding, exudate and infection.

Implications

This study may be help health care providers to use the results of this study in the clinical practice settings. And may this study results motivate researchers to make well design RCT and experimental studies with generalizable sample size. Also may improve clinical reasoning skills and support case-based learning, and may facilitate the evaluation of clinical practice guidelines.

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