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Symptom clustering and quality of life in patients with ovarian cancer undergoing chemotherapy

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ABSTRACT

Purpose: The symptom clusters in patients with ovarian cancer undergoing chemotherapy have not been well evaluated. We investigated the symptom clusters and effects of symptom clusters on the quality of life of patients with ovarian cancer.
Method: We recruited 210 ovarian cancer patients being treated with chemotherapy and used a descriptive cross-sectional study design to collect information on their symptoms. To determine interrelationships among symptoms, a principal component analysis with varimax rotation was performed based on the patient's symptoms (fatigue, pain, sleep disturbance, chemotherapy-induced peripheral neuropathy, anxiety, depression, and sexual dysfunction).
Results: All patients had experienced at least two domains of concurrent symptoms, and there were two types of symptom clusters. The first symptom cluster consisted of anxiety, depression, fatigue, and sleep disturbance symptoms, while the second symptom cluster consisted of pain and chemotherapy-induced peripheral neuropathy symptoms. Our subgroup cluster analysis showed that ovarian cancer patients with higher-scoring symptoms had significantly poorer quality of life in both symptom cluster 1 and 2 subgroups, with subgroup-specific patterns. The symptom clusters were different depending on age, age at disease onset, disease duration, recurrence, and performance status of patients with ovarian cancer. In addition, ovarian cancer patients experienced different symptom clusters according to cancer stage.
Conclusions: The current study demonstrated that there is a specific pattern of symptom clusters, and symptom clusters negatively influence the quality of life in patients with ovarian cancer. Identifying symptom clusters of ovarian cancer patients may have clinical implications in improving symptom management.

1. Introduction

Ovarian cancer is the leading cause of mortality among gynecologic cancers in developed countries (Sankaranarayanan and Ferlay, 2006). Ovarian cancer is often asymptomatic in its early stages, and thus, most patients have widespread to other organs by the time of diagnosis (Ries et al., 1997). The five-year survival rate is about 90% in early-stage ovarian cancer, but it is only 30% in advanced stages (Berek and Novak, 2007). Because the prognosis is not good, aggressive treatments are often administered. Debulking surgery for ovarian cancer covers a wide range as compared with that for other gynecologic cancers, and chemotherapy is administered more in the case of ovarian cancers than in other gynecologic cancers (Berek and Novak, 2007). Accordingly, patients with ovarian cancer experience various physical and psychological symptoms such as fatigue, pain, nausea/vomiting, depression, and sleep disturbances. These symptoms are caused both by the cancer itself and in association with certain treatments, often with more severe symptoms due to the treatment used. Women also experience unique symptoms associated with the reproductive organs such as abdominal discomfort, vaginal dryness, hot flashes, and sexual discomfort (Koldjeski et al., 2003; Maughan and Clarke, 2001). In many cases, these symptoms all manifest at the same time, rather than just a single symptom appearing in isolation.

A 'symptom cluster' has been defined as a group of more than two symptoms that occur concurrently and are interrelated to each other; they may or may not have a common etiology (Kim et al.,

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2005). Each symptom in the cluster is independent, but they are strongly interrelated, and one symptom can affect another symptom through its effect on a third symptom (Fox et al., 2007; Kim et al., 2005).

Ovarian cancer patients have been reported to experience a number of symptoms concurrently, rather than isolated symptoms (Clevenger et al., 2013; Fox et al., 2007; Koldjeski et al., 2003; Lopez et al., 2011). The physical symptoms (fatigue, sleep disturbance, pain, neuropathy, and digestive changes) of ovarian cancer patients are related to psychological symptoms (Lopez et al., 2011), and newly diagnosed patients may experience abdominal bloating, vague abdominal pain, digestive problems, fatigue, and urinary problems (Koldjeski et al., 2003). Moreover symptom clusters sometimes show at different time points; that is, the gastrointestinal symptom cluster and body image symptom cluster may appear prior to chemotherapy and be maintained until the sixth round of chemotherapy, whereas the peripheral neurologic symptom cluster may present at third chemotherapy (Huang et al., 2016). These concurrent symptoms are the cause of reduced quality of life and functional status in many patients with cancer (Clevenger et al., 2013; Dodd et al., 2001; Miaskowski et al., 2006; Pud et al., 2008). As various symptoms are also caused by chemotherapy, it is important that the study of symptom clusters and their effects on quality of life be studied in ovarian cancer patients undergoing chemotherapy, rather than in cancer survivors. In a recent study of 192 patients with ovarian cancer undergoing chemotherapy, seven symptom clusters were identified and these clusters affected quality of life (Hwang et al., 2016). In addition, Huang et al. (2016) reported that the symptom cluster changed according to the timing of the chemotherapy treatment. However, these studies (Huang et al., 2016; Hwang et al., 2016) did not identify the demographic and clinical characteristics associated with the predominantly observed symptom cluster and the symptom clusters according to the cancer stage.

Identifying the symptom clusters of ovarian cancer patients can be beneficial for understand the significant symptoms that they experience. This may also assist in assessing the demographic and clinical characteristics related symptom clusters as well as recognizing symptom clusters according to cancer stage in ovarian cancer patients. Furthermore, the results of these studies can be used to predict potential concomitant symptoms that may appear in the future, thereby allowing for more effective symptom management methods to be used over the course of time (Kim et al., 2014). Therefore, in this study we investigated the symptom clusters of ovarian cancer patients and their effects on quality of life. Our results could be used as a basis for developing interventions to improve the quality of life and symptom relief in patients with ovarian cancer.

2. Methods

2.1. Study design

We used a descriptive cross-sectional design to examine symptom clusters and to identify symptom clusters affecting quality of life in Korea ovarian cancer patients being treated with chemotherapy.

2.2. Subjects and procedure

Between July 14, 2014 and May 11, 2015, subjects were enrolled in the study from a tertiary hospital at Asan Medical Center with over 2700 beds and specifically, approximately 100 beds for gynecologic patients located in the Seoul, Korea. Patients were included only if informed written consent was obtained. Convenience sampling was used to select subjects. Inclusion criteria for the present study is as follows: (1) Inpatients with ovarian cancer being treated with chemotherapy following surgery more than one round of chemotherapy; (2) ≥20 years of age; (3) absence of any other major health problem that could potentially influence the symptoms and quality of life, such as uncontrolled diabetes mellitus, infection and inflammation, liver failure, or renal failure; and (4) absence of any other cancer ongoing treatments, such as radiation therapy or hormone therapy. Among 213 structured questionnaires distributed, three questionnaires were not included since they were incomplete (response rate: 98.65%). A total of 210 patients were eligible for this study.

The Institutional Review Board (IRB) of Asan Medical Center approved this study, and all subjects were required to provide informed consent, in compliance with IRB regulations. The subjects were given the option to voluntarily withdraw their informed consent at any time, and their personal data was kept strictly confidential throughout the study. A research nurse explained the aims and procedures of the study. Ovarian cancer patients who agreed to face-to-face interviews were administered structured questionnaires.

2.3. Instruments

Fatigue was assessed by using the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) (Webster et al., 2003). The FACIT-F is a 13-item questionnaire that measures an individual's level of fatigue during their usual daily activities over the week prior to filling out the questionnaire. The level of fatigue for each item is measured on a 4-point Likert scale (4 = not at all fatigued to 0 = very much fatigued) with acceptable reliability, validity, and sensitivity to change over time (Chandran et al., 2007). The reliability of the Korean version of FACIT-F has been established in cases of Korean cancer (Byun et al., 2010). The lower scores indicate a higher degree of fatigue. In this study, a FACIT-F score of 34 or lower was considered to indicate the presence of fatigue (Manir et al., 2012). Additionally, the degree of pain was measured by using a numerical rating scale (Numeric Rating Scale; NRS). The intensity of the pain patients were experiencing was scored 0 to10 points, 0 points being no pain at all, and 10 representing the point of severest pain unimaginable. A higher score indicates more severe pain. The subjects were asked to score the degree of pain felt at the time of measuring. In this study, an NRS score of 1 or higher was considered to indicate the presence of pain. Sleep disturbance was measured by using the Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989). The PSQI is a self-report questionnaire that assesses sleep quality and type of sleep disturbances over the last month (Buysse et al., 1989). The 19-item PSQI encompasses seven-component scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction. Higher global scores indicate worse sleep quality and a global score >5 indicates poor sleep (Buysse et al., 1989). The scale has a diagnostic sensitivity of 89.6% and a specificity of 86.5% (Carpenter and Andrykowski, 1998). The Korean version of the PSQI has demonstrated good reliability and validity (Sohn et al., 2012). Chemotherapy-induced peripheral neuropathy (CIPN) was measured by using the Functional Assessment of Cancer Therapy/Gynecologic Oncology Group Neurotoxicity (FACT/GOG-Ntx) subscale (Calhoun et al., 2003). The FACT/GOG-Ntx subscale contains 11 items covering sensory neuropathy, motor neuropathy, hearing neuropathy, and dysfunction associated with neuropathy. Each item in the FACT/GOG-Ntx subscale was scored from 0 to 4 points, with lower scores indicating a higher CIPN. The FACT/GOG-Ntx subscale has demonstrated good validity and reliability including