



## Review Article

## Paraneoplastic syndromes associated with gynecological cancers: A systematic review

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## HIGHLIGHTS

- A variety of paraneoplastic syndromes can be associated with gynecological cancers.
- These syndromes can affect all systems, and may lead to severe complications.
- A systematic literature search identified those related to gynecologic oncology.
- This article provides a summary and up-to-date information about each syndrome.

## ARTICLE INFO

## Article history:

Received 6 May 2017

Received in revised form 19 June 2017

Accepted 19 June 2017

Available online 24 June 2017

## Keywords:

Paraneoplastic syndromes

Paraneoplastic neurological syndromes

Paraneoplastic dermatoses

## ABSTRACT

A number of paraneoplastic syndromes have been described with gynecological cancers. These syndromes are induced by substances secreted by the tumor or by an immune response triggered by the cancer. Each system of the human body can be affected by different syndromes. Indeed, paraneoplastic syndromes occurring from tumors of the gynecologic tract were found to involve the nervous, ophthalmologic, dermatologic, rheumatologic, endocrine, hematologic and renal systems. These syndromes can manifest before, at the time, or after the diagnosis of cancer. They can also occur at the time of a recurrence. Knowledge about these syndromes is important for physicians caring for patients with cancers, as they can result in severe morbidity and must be treated appropriately.

Literature regarding paraneoplastic syndromes associated with tumors of the female genital tract is scattered and the subject has not been reviewed recently. A systematic literature search was thus conducted to identify paraneoplastic syndromes associated with gynecologic cancers. This review focuses on the cancers involved with each paraneoplastic syndrome, and on their pathophysiology, clinical manifestations, possible complications, outcomes, and treatments. As the mainstay of treatment in these conditions is often to address the underlying tumor, it is of upmost importance that physicians be aware of these rare cancer manifestations.

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## 1. Introduction

Paraneoplastic syndromes are clinical manifestations of a malignancy not directly caused by the primary tumor, metastasis, or their treatment with chemotherapy or radiotherapy [1]. These manifestations are induced by biological substances such as hormones, cytokines, and growth factors secreted by malignant neoplasm, or by cancer-associated immune reactions. Hormone hypersecretion from a hormone-secreting tissue is not considered a paraneoplastic syndrome [1]. They can affect all systems, and may lead to severe and life-threatening complications. These syndromes can appear before or concomitantly with the cancer, but can also develop after the diagnosis or at the time of recurrence.

It is of the upmost importance for clinicians to be aware of the various existing paraneoplastic syndromes, because these syndromes can be the first clinical presentation of an otherwise clinically silent malignancy. Their association with occult malignancy mandates an appropriate diagnostic workout. Moreover, treatment cornerstone of these conditions is usually to address the associated neoplastic process.

A review article by Ashour et al. in 1997 thoroughly described the paraneoplastic syndromes associated with gynecologic malignancies [1]. Since the publication of this landmark article, a substantial amount of additional knowledge has become available. The present article summarizes and provides an up-to-date literature review of the different paraneoplastic syndromes that can be related with cancers of the female genital tract.

## 2. Methods

A systematic literature search was conducted through PubMed, Embase and Cochrane Library in October 2016.

A search was done for the references containing in their title or abstract the terms vulva, vulvar, vagina, vaginal, cervix, cervical, uterus, uterine, endometrial, endometrium, tube\*, tubal, ovary, ovaries, or ovarian and cancer\* or neoplasm\* with any of these expressions: paraneoplastic syndrome(s), paraneoplastic disease(s), or paraneoplastic manifestation(s). In PubMed, MeSH terms "Genital Neoplasms, Female" and "Paraneoplastic Syndromes" were also used.

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