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Siba Pattanaik
Department of Bioinformatics, OUAT CPGS Center of Post-Graduation Studies, Bhubaneswar, Odisha, India

Deoraj Sharma
Department of Biotechnology, Trident Academy of Creative Technology, Bhubaneswar, Odisha, India

Corresponding Author:
Siba Pattanaik
Department of Bioinformatics, OUAT CPGS Center of Post-Graduation Studies, Bhubaneswar, Odisha, India

Impact of ovarian cancer on hormone imbalance and its remedies with ayurvedic medicines

Siba Pattanaik and Deoraj Sharma

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Abstract
Ovarian cancer is a cancer that forms in or on an ovary. It results in abnormal cell that have the capability to foray or spread to other parts of the body. When this process begins, there may be no or only vague symptoms. Symptoms appear more conspicuous as the cancer progresses. These symptoms may include bloating, pelvic pain, abdominal lump, constipation and loss of appetite. The common areas where cancer may spread include the filling of the tummy, lymph bumps, lungs and liver. The chance of ovarian cancer increases in those women who have ovulated more over their continuance. This problem also occurs in those women who begin ovulation at a youngish age and reach menopause at an aged age. Factors that can drop this problem include hormonal birth control and tubal ligation. Through this article I want to highlight the fact that such type of disease can be cure effectively by using some medicinal plant's products which are pain-free and smooth process with zero percent detriment to our body.

Keywords: Ovarian cancer, infertility, ayurveda, treatment, prevention

Introduction
Ovarian cancer is the third most common gynaecological cancer in Indian women. The most common gynaecological cancer is breast followed by cervical cancer. In India, 59,276 have been estimated as the new ovarian cancer cases by the end of 2020. The incidence of ovarian carcinoma is estimated to increase to 371,000 a year by 2035 (55%), while the death rate increases by 67% to 254,000 (American Cancer Society. 2017) [1]. Ovarian cancer is the second most common type of gynaecologic cancer. The ovaries are composed of three distinct cell types: epithelial cells, germ cells, and stromal cells. Each of these cell types can give rise to different kinds of tumours. 9 out of 10 ovarian tumours originate in the epithelial cells. Epithelial ovarian cancer is the most common, originating in the epithelial cells that cover the surface of the ovaries. A family history of ovarian cancer is the strongest risk factor for this disease. Women with mutations in the BRCA genes have a particularly increased risk. Some factors – such as having surgery to remove the ovaries, the use of oral contraceptives, and tubal ligation have been shown to help prevent ovarian cancer.

Stages of ovarian cancer
First, doctors use these criteria to determine the cancer's progression:
- Localized when no cancer has spread outside of the ovaries
- Regional when the cancer has spread to nearby lymph nodes or structures
- Distant when the cancer has spread to other parts of the body

Stage 1
In stage 1, the cancer is confined to the ovaries and hasn't spread to the abdomen, pelvis or lymph nodes, nor to distant sites. It's considered an early-stage cancer, which means that it offers the highest survival rate.
- Stage 1A: Cancer is present in one ovary.
- Stage 1B: Cancer is in both ovaries.
- Stage 1C is diagnosed when one of the following occurs:
- Stage 1C1: The tissue surrounding the tumour breaks during surgery and cancer may spread to the abdomen and pelvis (a process called a surgical spill).
- Stage 1C2: Cancer exists on the surface of one or both ovaries.
- Stage 1C2: The tissue surrounding the tumour has ruptured before surgery.
- Stage 1C3: Cancer cells exist in the fluid of the abdomen and pelvis.

If a patient has a tumour, which may be removed during biopsy or surgery, then it typically is given a tumour grade. Grades may be low or high, ranging from levels 1 to 3. The latter two are high-grade, and may grow much faster.
Following surgery, additional treatment may not be required for stage 1 ovarian cancer, especially if a patient has a low-grade tumour. However, if a patient is diagnosed with stage 1B or 1C, then chemotherapy may be recommended, in addition to further surgery or other treatments.

Stage 2
In stage 2, the cancer has spread from one or both ovaries to other areas of the pelvis. However, the cancer hasn't spread to nearby lymph nodes or distant sites.

- Stage 2A: Cancer has spread to the uterus or the fallopian tubes.
- Stage 2B: Cancer has spread to other nearby pelvic organs.

A patient may undergo surgery for staging and debulking, including a full hysterectomy (removal of the uterus) and bilateral salpingo-oophorectomy (removal of both fallopian tubes and both ovaries), as well as chemotherapy.

Stage 3
In stage 3, the cancer has spread to nearby lymph nodes and/or other parts of the abdomen, but it hasn't spread to distant sites.

- Stage 3A: Cancer has spread to lymph nodes in areas outside or behind the peritoneum, or cancer cells have spread outside of the pelvis.
- Stage 3B: Cancer has spread to the peritoneum, where it's 2 cm or smaller, and possibly the lymph nodes behind the peritoneum.
- Stage 3C: Cancer has spread to the peritoneum, where it's larger than 2 cm. It may have possibly spread to the lymph nodes in the abdomen, as well as to the surface of the liver or spleen.

Treatment for stage 3 is often similar to that of stage 2, but it may require more chemotherapy treatments and more monitoring for follow-up treatment.

Stage 4
In stage 4, the cancer has spread beyond the abdomen. This is considered a metastatic cancer, which means the cancer has been found in areas outside of the primary cancer area.

- Stage 4A: Cancer cells are detected in fluid around the lungs.
- Stage 4B: Cancer has spread outside the abdomen and may exist in the lymph nodes in the groin.

Treatments for stage 4 ovarian cancer depend on individual needs and what the cancer team recommends. It may begin with surgery or chemotherapy.

Fallopian tube and primary peritoneal cancers are also treated similarly to ovarian cancer.

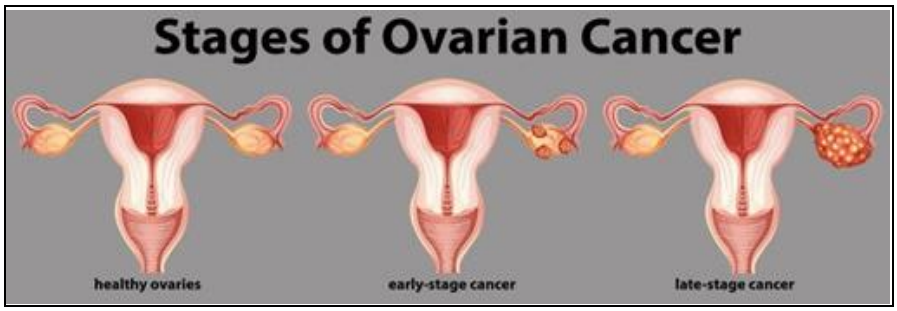

Fig 1: Stages of ovarian cancer (www.image//google.com)

Signs and symptoms
Early Symptoms Early signs and symptoms of ovarian cancer may be absent or subtle. In most cases, symptoms exist for several months before being recognized and diagnosed. Symptoms can be misdiagnosed as irritable bowel syndrome. The early stages of ovarian cancer tend to be painless. Symptoms can vary based on the subtype. Ovarian borderline tumors, also known as low malignant potential (LMP) ovarian tumors, do not cause an increase in CA125 levels and are not identifiable with an ultrasound. The typical symptoms of an LMP tumor can include abdominal distension or pelvic pain. Particularly large masses tend to be benign or borderline. The most typical symptoms of ovarian cancer (Chaudhary AK, Ahmad S, Mazumder A (2011) [2] include bloating, abdominal or pelvic pain or discomfort, back pain, irregular menstruation or postmenopausal vaginal bleeding, pain or bleeding.

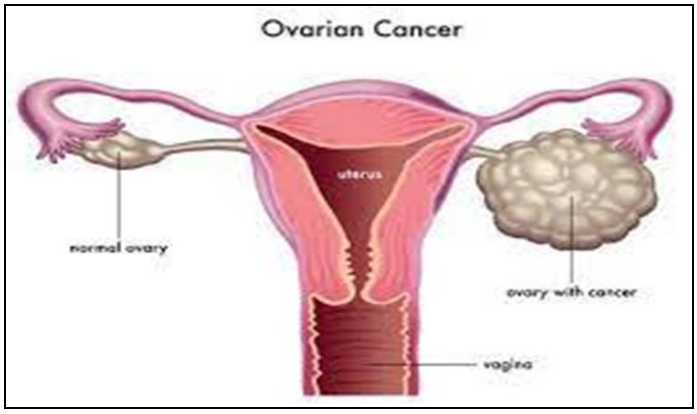

Fig 2: Showing difference between both the ovary. (www.google.image.com)

Later Symptoms

The growing mass may cause pain if ovarian torsion develops. Symptoms can be caused by a mass pressing on the other abdominopelvic organs or from metastases. If these symptoms start to occur more often or more severely than usual, especially after no significant history of such symptoms, ovarian cancer is considered. Metastases may cause a Sister Mary Joseph nodule. Rarely, teratomas can cause growing teratoma syndrome or peritoneal gliomatosis. Some experience menometrorrhagia and abnormal vaginal bleeding after menopause in most cases. Other common symptoms include hirsutism, abdominal pain, virilization, and an adnexal mass (Guo H, Zhang X, Cui Y *et al*. (2015) [3].

Impact after adulteration

In adolescents or children with ovarian tumors, symptoms can include severe abdominal pain, irritation of the peritoneum, or bleeding. Symptoms of sex cord-stromal tumors produce hormones that can affect the development of secondary sex characteristics. Sex cord-stromal tumors in prepubertal children may be manifested by early puberty; abdominal pain and distension are also common (Jayson GC, Kohn EC, Kitchener HC, *et al*. Ovarian cancer. Lancet 2014) [6]. Adolescents with sex cord-stromal tumors may experience amenorrhea. As the cancer becomes more advanced, it can cause an accumulation of fluid in the abdomen. If the malignancy has not been diagnosed by the time it causes ascites, it is typically diagnosed shortly thereafter. Advanced cancers can also cause abdominal masses, lymph node masses, or pleural effusion.

Risk factors

- Ovarian cancer is related to the amount of time spent ovulating. Thus, not having children is a risk factor for ovarian cancer, likely because ovulation is suppressed via pregnancy. During ovulation, cells are constantly stimulated to divide while ovulatory cycles continue. Therefore, people who have not borne children are at twice the risk of ovarian cancer than those who have. A longer period of ovulation caused by early first menstruation and late menopause is also a risk factor. Both obesity and hormone replacement therapy also raise the risk.
- The risk of developing ovarian cancer is less for women who have fewer menstrual cycles, no menstrual cycles, breast feeding, take oral contraceptives, have multiple pregnancies, and have a pregnancy at an early age. The risk of developing ovarian cancer is reduced in women who have had tubal ligation (colloquially known as having one's "tubes tied"), both ovaries removed or hysterectomy (an operation in which the uterus, and sometimes the cervix, is removed). Age is also a risk factor.

Hormone imbalance

Use of fertility medication may contribute to ovarian borderline tumor formation, but the link between the two is disputed and difficult to study. Fertility drugs may be associated with a higher risk of borderline tumors. Those who have been treated for infertility but remain nulliparous are at higher risk for epithelial ovarian cancer; however, those who are successfully treated for infertility and subsequently give birth are at no higher risk. This may be due to shedding of precancerous cells during pregnancy but the cause remains unclear. The risk factor may instead be infertility itself, not the treatment.

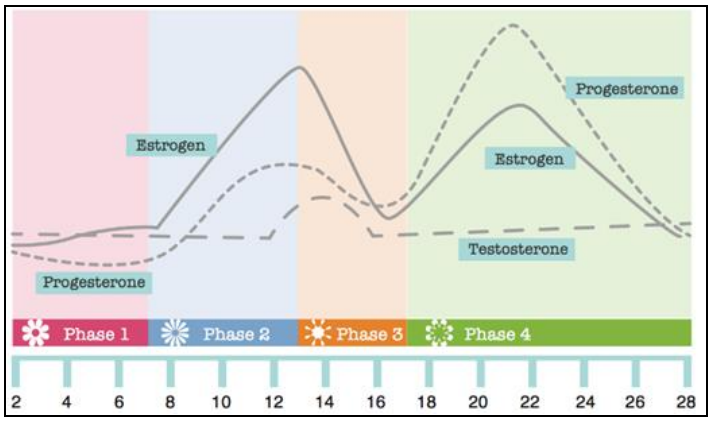

Fig 3: Hormonal graph representation (www.scidirect.com)

Hormonal conditions such as polycystic ovary syndrome and endometriosis are associated with ovarian cancer, but the link is not completely confirmed. Postmenopausal hormone replacement therapy (HRT) with estrogen likely increases the risk of ovarian cancer. The association has not been confirmed in a largescale study, but notable studies including the have supported this link. Postmenopausal HRT with combined estrogen and progesterone may increase contemporaneous risk if used for over 5 years, but this risk returns to normal after cessation of therapy. Estrogen HRT with or without progestins increases the risk of endometrioid and serous tumors but lowers the risk of mucinous tumors. Higher doses of estrogen increase this risk. Endometriosis is another risk factor for ovarian cancer,as is pain with menstruation (Kooti W, Servatyari K, Behzadifar M *et al*. (2017) [7].

Diagnosis

Diagnosis of ovarian cancer starts with a physical examination (including a pelvic examination) a blood test (for CA-125 and sometimes other markers), and transvaginal ultrasound. Sometimes a rectovaginal examination is used to help plan a surgery. The diagnosis must be confirmed with surgery to inspect the abdominal cavity, take biopsies (tissue samples for microscopic analysis), and look for cancer cells in the abdominal fluid. This helps to determine if an ovarian mass is benign or malignant

Ovarian cancer's early stages (I/II) are difficult to diagnose because most symptoms are nonspecific and thus of little use in diagnosis; as a result, it is rarely diagnosed until it spreads and advances to later stages (III/IV). Additionally, symptoms of ovarian cancer may appear similar to irritable bowel syndrome. In patients in whom pregnancy is a possibility,

BHCG level can be measured during the diagnosis process. Serum alpha-fetoprotein, neuron specific enolase, and lactate dehydrogenase can be measured in young girls and adolescents with suspected ovarian tumors as younger patients are more likely to have malignant germ cell tumors.

• An adnexal mass is a significant finding that often indicates ovarian cancer, especially if it is fixed, nodular, irregular, solid, and/or bilateral. 13–21% of adnexal masses are caused by malignancy; however, there are other benign causes of adnexal masses, including ovarian follicular cyst, leiomyoma, endometriosis, ectopic pregnancy, hydrosalpinx, tub ovarian abscess, ovarian torsion, dermoid cyst, cystadenoma (serous or mucinous), diverticular or appendiceal abscess, nerve sheath tumor, pelvic kidney, ureteral or bladder diverticulum, benign cystic mesothelioma of the peritoneum, peritoneal tuberculosis, or periovarian cyst. Ovaries that can be felt are also a sign of ovarian cancer in postmenopausal women. Other parts of a physical examination for suspected ovarian cancer can include a breast examination and a digital rectal exam. Palpation of the supraclavicular, axillary, and inguinal lymph nodes may reveal lymphadenopathy, which can be indicative of metastasis. Another indicator may be the presence of a pleural effusion, which can be noted on auscultation (McCluggage WG. 2017) [10].

General prevention

• People with strong genetic risk for ovarian cancer may consider the surgical removal of their ovaries as a preventive measure. This is often done after completion of childbearing years. This reduces the chances of developing both breast cancer (by around 50%) and ovarian cancer (by about 96%) in people at high risk. Women with BRCA gene mutations usually also have their Fallopian tubes removed at the same time (Salpingo-Oophorectomy), since they also have an increased risk of Fallopian tube cancer. However, these statistics may overestimate the risk reduction because of how they have been studied.

People with a significant family history for ovarian cancer are often referred to a genetic counselor to see if testing for BRCA mutations would be beneficial. The use of oral contraceptives, the absence of 'periods' during the menstrual cycle, and tubal ligation reduce the risk. There may an association of developing ovarian cancer and ovarian stimulation during infertility treatments. Endometriosis has been linked to ovarian cancers. Human papillomavirus infection, smoking, and talc have not been identified as increasing the risk for developing ovarian cancer.

Hormonal therapy

Despite the fact that 60% of ovarian tumors have estrogen receptors, ovarian cancer is only rarely responsive to hormonal treatments. A Cochrane review found a lack of evidence about the effects of tamoxifen in people with relapsed ovarian cancer. Estrogen alone does not have an effect on the cancer, and tamoxifen and letrozole are rarely effective. “Some women with borderline malignancy ovarian cancer and stromal ovarian cancer may receive hormonal therapy (Kurman RJ, Shih Ie M. The Dualistic Model of Ovarian Carcinogenesis: Revisited, Revised, and Expanded. Am J Pathol. 2016) [9].

Advanced ayurvedic treatment on ovarian cancer

Ovarian cancer is one of the largely prominent gynaecological malice after bone cancer. Although myriad literature is available, there's no specific biomarker available for the individualized treatment strategy. The attainability of effective medicine remedy for ovarian cancer calls for a critical drive in its development from the multidisciplinary scientific community. Indian Ayurvedic drug pharmacology is extensively appreciated and accepted for its immense healthcare benefits. Bioinformatics and cheminformatics approaches can be effectively used to screen phytochemicals present in the Indian Ayurvedic shops against ovarian cancer target receptors. Recent studies discern that POTE, a cancer-testis antigen (CTA) family, plays a pivotal part in the proliferation and progression of cancers including ovarian cancer. Specifically, POTEE paralog has been observed to be hypermethylated in ovarian cancer. This study undertakes an in-silico analysis of Indian Ayurvedic shops for their anticancer efficacity against ovarian cancer proliferation target receptor POTEE. Structures of 100 phytochemicals from 11 Ayurvedic shops were screened with ADME criteria, and good phytochemicals were subordinated to molecular docking and commerce analysis. Only 6 phytochemicals having a high affinity to the target receptor (POTEE) were also subordinated to an all- snippet replica exchange molecular dynamics simulation for 50 ns. List affections of 6 phytochemicals cedeodarin, deodarin, hematoxylin, matairesinol, quercetin, and taxifolin with POTEE were-8.1,-7.7,-7.7,-7.9,-8.0, and-7.7 kcal/ spook, independently, and their RMSD were recorded as zero. This study concludes that phytochemicals present in Indian Ayurvedic shops videlicet Cedrus deodara and Asparagus racemosus retain inhibitory goods against ovarian cancer proliferation receptor POTEE (Shafabakhsh R, Asemi Z (2019) [14] Quercetin).

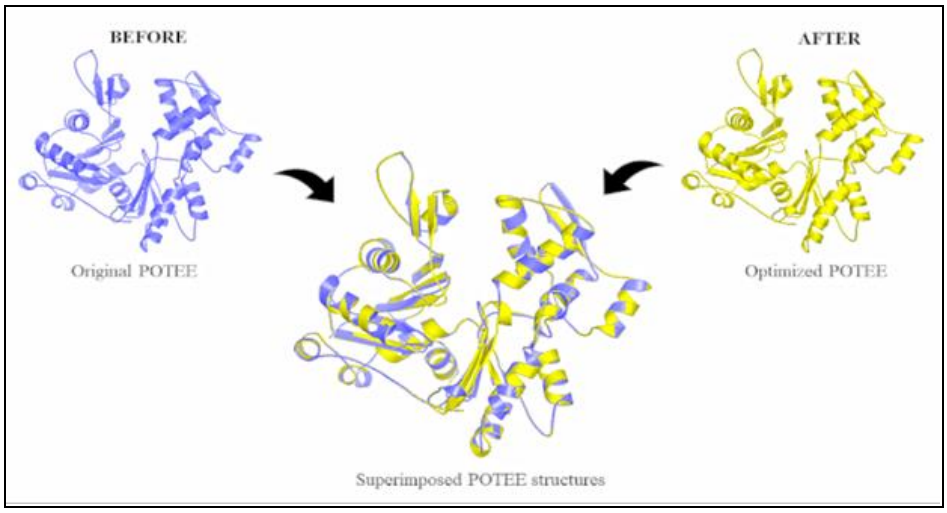

Fig 4: Impact of molecules phytochemical after use of ayurvedic treatment. (www.spinger.com)

Treatment by ayurveda

According to Ayurveda, a cyst is correlated as Gradnhi which is mainly due to the vitiated Kapha dosha. In the Samprati (pathogenesis) of Granthi, it is mentioned that Mamsa (muscle fibers), Rakta, and Medo Dhatu are vitiated. When levels of impurities and toxins increase in rasa and rakta dhatus, the body stores them in the form of cysts around ovaries. So, the presence of multiple cysts indicates high levels of impurities and toxins in these dhatus. Sign and symptoms in PCOD patients suggest an imbalance of all three doshas.

The Ayurvedic treatment of ovarian cancer is basically intended to treat cancer, slowing its spread and survival. Ashwagandha (Withania somnifera), Shatavari (Asparagus racemosus), Suvarna-Sutshekhar-Ras, Suvarna-Parpati, Suvarna-Raj-Vangeshwar-Ras, Suvarna-Malini-Vasant, Trivanga-Bhasma, Suvarna-Bhasma and Heerak-Bhasma are used to enhance the immune status of the body. In order to prevent the body from side effects medicines like Laxmi-Vilas-Ras, Shrung-Bhasma, Ashwagandha, Shankh-Vati, and Laghu-Sutshekhar-Ras are used.

Ashwagandha (Withania Somnifera)

Ashwagandha is an ancient medicinal plant and a very important ingredient in Ayurveda science. It is also called Indian Ginseng and Winter Cherry. An Ashwagandha plant is ideally a small shrub with yellow flowers native to India and North Africa. Ashwagandha has anti-cancer properties that help slow the growth of cancer, it also helps regulate stress that comes with various therapies and treatments that a Cancer patient has to go through.

- Reduces Blood sugar levels
- Anti-cancer properties
- Reduces Cortisol Levels
- Reduces stress and anxiety

Fig 5: Herbs that use in treatment (www.image.ayru.com)

Shatavari (Asparagus Racemosus)

Shatavari is an important component of Ayurveda, it is used in many Ayurvedic Medicines to boost immunity. This is a species of Asparagus plant; it has been used for many centuries in Indian Ayurvedic Medicine. It can be taken as a tablet, powder, or liquid essence.

Improving female reproductive health

Reducing symptoms of menopause

Antioxidant effects

Suvarna-Sutshekhar-Ras

Fig 6: Image of Sutshekhar Ras (www.ayuraveda.com)

Cancer Treatment is an intensively researched topic in the field of Ayurvedic Medicine. It is said to have anti-cancer properties that help in the Rejuvenation and Revitalization of our bodies. It is an Ayurvedic Formulation prepared from the mixture of herbs and minerals like-

1. Juice extract of Bhringaraja – Eclipta alba (in sufficient quantity)
2. Shuddha Parada purified Mercury
3. Suddha gandhaka – purified sulphur
4. Swarna Bhasma – Gold calx
5. Roupya Bhasma – silver calx
6. Suddha suhaga – purified borax
7. Saunth – Zingiber officinale nigrum
8. Maricha – Piper
9. Pippali – Piper longum herb seeds
10. Datura – Datura
11. Tamra Bhasma – Copper calx
12. Elaichi – Elettaria cardamomum
13. Dalchini – Cinnamomum zeylanicum
14. Tejpatta – Cinnamomum tamala
15. Nagakesara – Mesua ferrea
16. Shankha Bhasma – Conch Shell calx

Suvarna-Parpati: It is an Ayurvedic mixture made by

Shuddha Parad: Purified Mercury

Shudh Gandhaka: Purified Sulphur

Swarna Bhasma- Gold Calx.

Conclusion

Ovarian cancer is a growth of cells that forms in the ovaries. The cells multiply quickly and can invade and destroy healthy body tissue. The female reproductive system contains two ovaries, one on each side of the uterus. The ovaries each

about the size of an almond produce eggs (ova) as well as the hormones estragon and progesterone. Ayurveda is an ancient science which focuses on Prevention as its vital aspect. Ayurvedic Treatment for Ovarian Cancer involves having a diet monitored by Ayurvedic doctors, with special care to the environment around the patients. It is focused on the holistic development of an individual rather than only ovarian cancer. Ayurveda poses no harm to existing healthy cells in a person's body while the treatment is ongoing, while they get damaged if a person takes Chemotherapy. Ayurveda is not just a way but a weapon to our nation gifted by earth itself.

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