



Protecting Women from Cancer by Giving HPV-Vaccine

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ABSTRACT:

Role of women in human life in various stage are as a mother , wife, sister, sister –in-law, mother- in – law, daughter, daughter-in- law friend saving her life protecting her life from any type of cancer, can save a whole family

Keywords: WHO, HPV

Introduction

World Health Organization (WHO) has given 7 warning signs of cancer which should alarm any person and seek medical advice if these symptoms persist for more than two weeks.

These are:

- 1.Change in bowel and bladder habits
- 2.Any sore anywhere in the body that doesn't heal
- 3.Unusual bleeding or discharge from any opening in the body
- 4.Unexplained weight loss or loss of appetite
- 5.Difficulty in swallowing or chronic indigestion
- 6.Lumps anywhere in the body
- 7.A nagging cough or persistent hoarseness of voice

Some of the cancers that most often affect women are breast, colorectal, endometrial, lung, cervical, skin, and ovarian cancers.

Knowing about these

cancers and what you can do to help prevent them or find them early (when they are small, haven't spread, and might be easier to treat) may help save your life.

Breast cancer

Breast Cancer is the most common cancer in American women, except for skin cancers. It can occur at any age, but the risk goes up as you get older. Because of certain factors, some women may have a greater chance of having breast cancer than others. But every woman should know about the risks for breast cancer and what they can do to help lower their risk.

Colorectal cancer

Colorectal Cancer is cancer that starts in the colon or the rectum. Some factors that increase colorectal cancer risk include being overweight or obese, physical inactivity, a diet high in red and processed meats, smoking, heavy alcohol use, being older, and a personal or family history of colorectal cancer or polyps.

Endometrial cancer

Endometrial Cancer is a cancer of the endometrium (the inner lining of the uterus). The risk of endometrial cancer increases as a woman gets older. Things that affect hormone levels, like taking estrogen without progesterone and taking tamoxifen for breast cancer treatment or to lower breast cancer risk can increase a woman's chance of getting this cancer. Having an early onset of menstrual periods, late

menopause, a history of infertility, or not having children can increase the risk, too. Women with a personal or family history of hereditary non-polyposis colorectal cancer (HNPCC or Lynch syndrome) or polycystic ovary syndrome (PCOS), or those who are obese, also have a higher risk for getting endometrial cancer. Women who have had breast cancer or ovarian cancer may also have an increased risk of endometrial cancer.

Lung cancer

Lung Cancer is most often caused by exposure to chemicals and other particles in the air. While Smoking Tobacco is the leading cause of lung cancer, not all people with lung cancer smoke. Some might have smoked, and some have never smoked at all

Skin cancer

Anyone can get skin cancer but people with fair skin are more likely to get skin cancer than people with darker skin. Most basal and squamous cell skin cancer are caused by repeated and unprotected skin exposure to ultraviolet (uv) rays from sunlight, as well as from man-made sources such as tanning beds. A type of skin cancer called melanoma is less common than some other types of skin cancer, but is more dangerous because it is more likely to grow and spread. People who have had other types of skin cancers and people with a close family member who had melanoma have an increased risk for melanoma.

Ovarian cancer

Although ovarian cancer can occur at any age, it is more likely to occur as women get older. Women who have never had children, or who had their first child after age 35 may be at increased risk for this cancer. Women who have used estrogen alone as hormone replacement therapy are also at increased risk. Women with a personal or family history of hereditary non-polyposis colorectal cancer (HNPCC or Lynch Syndrome), ovarian cancer, or breast cancer are more likely to have a higher risk for ovarian cancer. But women who don't have any of these conditions or risk factors can still get ovarian cancer.

Cervical cancer

Chronic infection by certain types of the human papillomavirus (HPV) is the most important risk factor for cervical cancer. One can get HPV through intimate skin-to-skin contact, such as having vaginal, anal, or oral sex with someone who has the virus. Other risk factors for cervical cancer include smoking, having a weakened immune system, having had a chlamydia infection, being overweight, being exposed to or taking certain hormone treatments, and not having regular cervical cancer screening tests.

Avoid smoking and help to protect yourself from HPV by using condoms. The HPV vaccines can protect against certain HPV infections linked to cancer.

The American Cancer Society recommends routine HPV vaccination for girls and boys ages 9 to 12. Children and young adults ages 13 to 26 who haven't been vaccinated, or who haven't gotten all their doses, should get the vaccine as soon as possible. Vaccination at the recommended ages will help prevent more cancers than vaccination at older ages. If you're between the ages of 27 to 45, talk to your doctor to find out if HPV vaccination might benefit you.

Having regular screening tests can help find changes in the cervix that can be treated before they become cancer. The tests for cervical cancer screening are the HPV test and the Pap test.

The HPV test looks for infections by types of HPV that can cause precancers and cancers of the cervix. The Pap test looks at the cells taken from the cervix to find changes that might be cancer or precancer. Regular screening can help find cervical cancer early, when it's small, has not spread, and might be easier to treat.

The American Cancer Society recommends the following for people who have a cervix and are at average risk for cervical cancer:

- Cervical cancer testing should start at age 25. People under age 25 should not be tested.
- People between the ages of 25 and 65 should get a primary HPV test every 5 years. A primary HPV test is an HPV test that is done by itself for screening. If you cannot get a primary HPV test,

get a co-test (an HPV test with a Pap test) every 5 years or a Pap test every 3 years.

- The most important thing to remember is to get screened regularly, no matter which test you get.
- People over age 65 who have had regular cervical cancer testing in the past 10 years with normal (or "negative") results should not be tested for cervical cancer. Your most recent test should be within the past 3 to 5 years. Those with a history of serious cervical precancer should continue to be tested for at least 25 years after that diagnosis, even if testing goes past age 65,
- People who have had a total hysterectomy (removal of the uterus and cervix) should stop testing unless the surgery was done to treat cervical cancer or a serious precancer.
- People who have been vaccinated against HPV should still follow the screening recommendations for their age group.

Pap smear

The Papanicolaou test is a method of cervical screening used to detect potentially precancerous and cancerous processes in the cervix or colon.

Abnormal findings are often followed up by more sensitive diagnostic procedures and, if

warranted, interventions that aim to prevent progression to cervical cancer.

Study JD IMS Hyd, - Several camps were done by the IMS team and JD IMS Hyd, the team consisted of doctors of various specialities of various dispensaries, staff nurses, pharmacist, lab- technician , and other staff of various dispensaries worked in this camps /dispensaries and study and screening and health awareness programs were done for more than eight thousand workers / beneficiaries from various industries / establishment.

Pap smear results.

The Pap test (or Pap smear) looks for precancers, cell changes on the cervix that might become cervical cancer if they are not treated appropriately. The HPV test looks for the virus (human papillomavirus) that can cause these cell changes.

The test results usually take 1–3 weeks to come back.

Most test results are negative, but they can sometimes be positive. A positive result does not confirm that a person has cancer, but it indicates that more investigation is necessary.

Table 1:

Age	No.
25-29	59
30-34	466
35-39	1351
40-44	1417
45-49	1199
50-54	731
55-59	36
60+	33
Total	5286

Numerous studies have demonstrated an increased risk of HPV infection at younger ages—the highest prevalence of HPV occurs among adolescents and young adults between the ages of 15 and 25,20,24–26 and it is believed that more than 75% of new HPV infections occur in individuals of this age range.

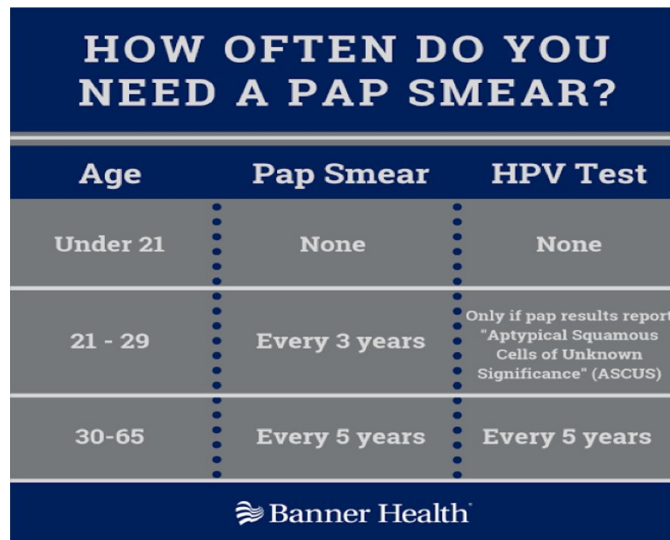


Table 2:

Papsmear results	Normal	Number	N	CIN1	CIN 2,3
Negative		5260		Not indicative	
*Minor reactive		20			
exchange					
Total Abnormal		5280			
LSL		5	1	3	1
HSI L		1	0	0	1
Total		6	1	3	2

CIN, cervical intraepithelial neoplasia, LSIL, low- grade spuamous inteapithelial lesion; HSIL, high- grade squamous intraepithelial lesion.

Vaccines

HPV vaccine was given to women (employees and beneficiaries) of various ages of various industries and establishments of Telangana by IMS department (ESI Telangana)

Benefits of vaccine

HPV is known to cause cancers of the throat, cervix, vulva ,vagina, penis and anus .The HPV vaccine works very well.

Studies have shown that the vaccine provides close to 100% protection against infections and pre-cancers caused by certain types of HPV.

All females ages 9 to 45 can get the HPV vaccine to protect against genital warts and/or different types of HPV that can cause cancer. It's recommended that children get the vaccine at

age 11 or 12, so they're fully protected years before they become sexually active.

Human papillomavirus vaccines are vaccines that prevent infection by certain types of human papillomavirus. Available HPV vaccines protect against either two, four, or nine types of HPV. All HPV vaccines protect against at least HPV types 16 and 18, which cause the greatest risk of cervical cancer .

HPV vaccines are administered as a two-dose series (0, 6-12 months) for most persons who initiate vaccination at ages 9 to 14 years, and a three-dose series (0, 1-2, 6 months) for persons who initiate at ages 15 to 45 years, and for immunocompromised persons

When child gets the HPV vaccine they will make proteins called antibodies that fight the virus.

Antibodies give strong and long-lasting protection.

Current research shows that there's no sign the vaccine protection lessens with time.

HPV vaccine is safe - Like any vaccination, there may be common mild side effects from the HPV vaccine that go away quickly like headache or fever. There can be pain, redness, and/or swelling where the shot was given. A small number of people may have a more serious side effect that could occur with any vaccine, such as an allergic reaction or fainting when the vaccine is given. Anyone who has a severe allergy to yeast or any other ingredient in the vaccine should not receive the HPV vaccine.

There are no data to suggest that getting the HPV vaccine will affect chances of having children later on (future fertility). In fact, the HPV vaccine can help protect women from future fertility problems linked to cervical cancer and pre-cancer. The HPV vaccine is a safe way to help protect health and the ability to have healthy babies.

The ingredients in the HPV vaccine, like all vaccines, help make sure that it is effective and safe. These ingredients occur naturally in the environment, the human body, and foods. For example, the HPV vaccine contains aluminum like the hepatitis B and Tdap vaccines. Aluminum boosts the body's immune response to the vaccine. People are exposed to aluminum every day through food, cooking utensils, water, and even breast milk. Aluminum-containing vaccines have been used for decades and have been given safely to more than 3 billion people. The HPV vaccine is strongly recommended for boys and girls. It can help protect them from infection with the most common types of HPV that can cause cancer when they get older. HPV is so common that almost everyone (at least 8 out of 10 people in the US) will come in contact with it at some point in their lives.

Most HPV infection goes away without any health problems. However, there is no way to know when it won't and an infection could lead to cancer. Vaccinating your child against HPV helps protect them.

Prevention is better than Cure: in Cancer prevention step ahead of cancer diagnosis and treatment. For this, we need to understand the

implications imparted by cancer in the patient and his caregiver's life.

1. Financial Implications –

According to the latest WHO data, India has a cancer mortality rate of 79 per 100,000 deaths. Also, cancer mortality is projected to increase to over 900,000 deaths by the end of this decade. In India, out of the pocket expenditure on cancer treatment is among the highest for any ailment. More so, it is higher in private facilities than public facilities. This expenditure is in excess of 20% of the annual per capita household expenditure of the majority of households in India. The cost remains high for almost all cancer management. With socioeconomic situations like India, people simply cannot afford it.

2. Social Implications –

Cancer does not just affect an individual but the entire family. Cancer diagnosis, treatment, and sessions of chemo and radiotherapy take a long time of not only the person affected but also of the person's family. In India, the majority of households have a single earning member, and if in case the breadwinner itself is the patient then there is a huge financial and social implication on the family. There is also a compromise in the quality of life of the patients post-treatment, which further puts a socio-economic burden on the entire family.

Although these days, with the advancement in treatment techniques and reduction in side-effects of treatment and proper rehabilitation of patients post-treatment, the quality of life is not a big challenge and is well maintained.

3. Emotional Implications

– Talking of objective assessment of psychological implication because of cancer in our country, it was found in a study from Bangalore, that psychiatric morbidity ranged from 41.7% to 46%, with most common disorders being anxiety and depression. Depression rates ranged from 4.4% to 89.9% and anxiety rates range from 1.2% to 97.8%. This wide range could be due to the heterogeneity in sociodemographic factors. India is a plural society in terms of religion, social class, literacy, place of stay, family

structure, and all of these have implications for the occurrence of emotional distress following the diagnosis of cancer. Such high incidences of psychological distress are not only prevalent in patients but are also seen in their caregivers. This makes a great impact on the entire family of the cancer patient.

Looking at these aspects which get affected from the time when cancer is diagnosed, to the time when treatment begins and ends and also after the entire treatment, makes us realize the great importance of preventing cancers and detecting them early so that individual's life is not affected to such an extent.

In women, these are stomach, cervix, ovary, oral, and breast cancer. These cancers together account for almost 47% of all cancers and these are preventable cancers. Hence, knowing the preventive aspects of these cancers can save us from the above mentioned holistic damage done by cancers.

Preventive strategies are divided into primary and secondary prevention and these depend on the risk factors associated with cancers which are divided into modifiable and non-modifiable risk factors. The modifiable risk factors are generally the ones associated with lifestyle and habits like smoking and alcohol consumption, unhealthy food habits, sedentary lifestyle, lack of exercise, etc. The non-modifiable risk factors include the genetic and hereditary causes of cancers which cannot be prevented but may be diagnosed early to keep a check on the cancer occurrence.

So, primary prevention aims at a set of interventions that keep a cancerous process from ever developing. It includes health counseling and education, environmental controls, and product safety as examples. Secondary prevention is that set of interventions leading to the discovery and control of cancerous or precancerous processes while localized, i.e., screening, early detection, and effective treatment.

Primary Prevention:- Examples of relevant primary prevention are cessation of smoking and alcohol consumption, which account for the majority of cancers in the human body. Smoking

in any form is dangerous. Both active and passive smoking are equal contributors. Even a single puff of smoke puts oneself at risk of developing cancer. Risk is never zero but decreases significantly after cessation. Similarly with after quitting alcohol, the risk never goes down to zero but decreases dramatically.

These two major culprits not only are big contributors to cancer development but are also responsible for other diseases like hypertension, heart illness, diabetes, kidney failure, liver failure, etc.

The other modifiable and important factors of lifestyle alteration are exercise and food habits. There has been too much westernization of Indian food habits, which has diverged from healthy, endemic eating style to unhealthy western style of eating. It has been proven that less consumption of fruits and vegetables and more consumption of processed foods lead to bowel cancer, breast cancer, and also to diabetes, hypertension and heart diseases. We, Indians should focus on eating habits that are native to our country.

Our country is diverse in different kinds of food production and consumption suiting diverse population variety residing here.

Lately, the lifestyle risk factor which has also shown its impact on the rising incidence of breast cancer in India is the modern lifestyle practice of late marriage, late childbirth, no childbirth, or no breastfeeding. All these contribute to an increase in estrogen hormone in the female body which eventually is responsible for developing breast cancer. In India, there has been a trend towards an increase in breast cancer incidence over the past 2 decades which could be explained on the basis of these observations. But, the other reason for the rising incidence is also contributed by awareness about breast cancer in our society now.

More screen-detected and early-stage cancers are now diagnosed, treated, and cured with cure rates of above 90%.

One of the examples of primary prevention is vaccine immunization. Vaccination against Human Papilloma Virus (HPV) for prevention against cervical cancer has shown promising

results and is now recommended in girls aged 9 years and above with either 2 doses for age group 9-14 years or 3 doses for age ≥ 15 years. Secondary Prevention: A very important contribution to early diagnosis and treatment is done by secondary preventive measures which mostly included the screening tests. By definition, screening means checking for cancer (or for conditions that may become cancer) in people who have no symptoms.

Screening programs have shown good results in cervical cancer prevention in our country. It is done with the help of simple tests like Pap Smear or HPV DNA/RNA in samples of cells taken from the cervix. It is done in females of sexually active age group and has shown to decrease deaths due to cervical cancer by 30%

Reference

- Schiffman M, Castle PE, Jeronim J, Rodrigue AC, Wacholde S. Human papillomavirus and cervical cancer. *Lancet*. 2007;370:890–907. [PubMed] [Google Scholar]
- Sankaranarayanan R, Ferlay J. Worldwide burden of gynecological cancer: The size of the problem. *Best Pract Res Clin Obstet Gynaecol*. 2006;20:207–25. [PubMed] [Google Scholar]
- Singh N. HPV and Cervical cancer - prospects for prevention through vaccination. *Indian J Med Paediatr Oncol*. 2005;26:20–3. [Google Scholar]
- WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). Summary report on HPV and cervical cancer statistics in India 2007. [Last Assessed on 2008 May 1]. Available from: <http://www.who.int/hpvcentre>.
- Howley PM, Lowy DR. Papillomaviruses and their replication, chapter 65. In: Knipe DM, Howley PM, editors. *Field's Virology*. 4th ed. Vol. 2. Philadelphia: Lippincott Williams and Wilkins; 2001. pp. 2197–229. [Google Scholar]
- Burd EM. Human Papillomavirus and cervical cancer. *Clin Microbiol Rev*. 2003;16:1–17. [PMC free article] [PubMed] [Google Scholar]
- Munoz N, Bosch FX, de Sanjose S, Herrero R, Castellsague X, Shah KV, et al. Epidemiologic classification of human papillomavirus types associated with cervical cancer. *N Eng J Med*. 2003;348:518–27. [PubMed] [Google Scholar]
- World Health Organization. HPV IARC monograph summary. *Lancet Oncol*. 2005;6:204. [Google Scholar]
- Dunne EF, Markowitz LE. Genital human Papillomavirus infection. *Clin Infect Dis*. 2006;43:624–9. [PubMed] [Google Scholar]
- Carter JJ, Koutsky LA, Hughes JP, Lee SK, Kuypers J, Kiviat N, et al. Comparison of human papillomavirus types 16, 18, and 6 capsid antibody responses following incident infection. *J Infect Dis*. 2000;181:1911–9. [PubMed] [Google Scholar]
- Myers ER, McCrory DC, Nanda K, Bastian L, Matchar DB. Mathematical model for the natural history of human papillomavirus infection and cervical carcinogenesis. *Am J Epidemiol*. 2000;151:1158–71. [PubMed] [Google Scholar]
- Bosch FX, de Sanjosé SS. Human papillomavirus and cervical cancer - burden and assessment of causality. *J Natl Cancer Inst Monogr*. 2003;31:3–13. [PubMed] [Google Scholar]
- Munoz N, Castellsague X, de Gonzalez AB, Gissmann L. HPV in the etiology of human cancer. *Vaccine*. 2006;24:S1–10. [PubMed] [Google Scholar]
- Castellsague X, Munoz N. Cofactors in human papillomavirus carcinogenesis - role of parity, oral contraceptives, and tobacco smoking. *J Natl Cancer Inst Monogr*. 2003;31:20–8. [PubMed] [Google Scholar]
- Winer RL, Hughes JP, Feng Q, O'Reilly S, Kiviat NB, Holmes KK, et al. Condom use and the risk of genital human papillomavirus infection in young women. *N Engl J Med*. 2006;354:2645–54. [PubMed] [Google Scholar]
- Ferenczy A, Franco E. Cervical-cancer screening beyond the year 2000. *Lancet*

- Oncol. 2001;2:27–32. [PubMed] [Google Scholar]
17. Huang CM. Human Papillomavirus and vaccination. *Mayo Clin Proc.* 2008;83:701–7. [PubMed] [Google Scholar]
 18. Singhal T. Indian Academy of Pediatrics Committee on Immunisation (IAPCOI) - Consensus Recommendations on Immunization 2008. *Indian Pediatr.* 2008;45:635–48. [PubMed] [Google Scholar]
 19. Villa LL, Costa RL, Petta CA, Andrade RP, Ault KA, Giuliano AR, et al. Prophylactic quadrivalent human Papillomavirus (types 6, 11, 16 and 18) L1 virus-like particle vaccine in young women: A randomized double-blind placebo-controlled multicentre phase II efficacy trial. *Lancet Oncol.* 2005;6:271–8. [PubMed] [Google Scholar]
 20. Harper DM, Franco EL, Wheeler C, Ferris DG, Jenkins D, Schuind A, et al. Efficacy of a bivalent L1 virus-like particle vaccine in prevention of infection with Human Papillomavirus types 16 and 18 in young women: A randomized controlled trial. *Lancet.* 2004;364:1757–65. [PubMed] [Google Scholar]
 21. Centers for Disease Control and Prevention. Quadrivalent Human Papillomavirus Vaccine Recommendations of the Advisory Committee on Immunization Practices (ACIP) *MMWR.* 2007;56(RR-2):1–32. [PubMed] [Google Scholar]
 22. Villa LL, Ault KA, Giuliano AR, Costa RL, Petta CA, Andrade RP, et al. Immunologic responses following administration of a vaccine targeting human Papillomavirus Types 6, 11, 16, and 18. *Vaccine.* 2006;24:5571–83. [PubMed] [Google Scholar]
 23. Villa LL, Costa RL, Petta CA, Andrade RP, Paavonen J, Iversen OE, et al. High sustained efficacy of a prophylactic quadrivalent human papillomavirus types 6/11/16/18 L1 virus-like particle vaccine through 5 years of follow-up. *Br J Cancer.* 2006;95:1459–66. [PMC free article] [PubMed] [Google Scholar]
 24. Schiller JT, Frazer IH, Lowy DR. Human Papillomavirus vaccines. In: Plotkin SA, Orenstein WA, editors. *Vaccines.* 5th ed. Philadelphia: Saunders; 2008. pp. 243–57. [Google Scholar]
 25. Markowitz LE, Dunne EF, Saraiya M, Lawson HW, Chesson H, Unger ER. Quadrivalent Human Papillomavirus Vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP) *MMWR Recomm Rep.* 2007;56:1–24. [PubMed] [Google Scholar]
 26. Markowitz LE, Dunne EF, Saraiya M, Lawson HW, Chesson H, Unger ER. Quadrivalent human papillomavirus vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP) [Last Accessed on 2008 Apr 28];*MMWR Recomm Rep.* 2007 56(RR-2):1–24. Available from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5602a1.htm> . [PubMed] [Google Scholar]
 27. American College of Obstetricians and Gynecologists. HPV Vaccine - ACOG Recommendations. [Last Accessed on 2008, April 28]. Available from: http://www.acog.org/departments/dept_notice.cfm?recno=7andbulletin=3945 .
 28. Saslow D, Castle PE, Cox JT, Davey DD, Einstein MH, Ferris DG, et al. Gynaecologic Cancer Advisory Group. American Cancer Society guideline for human papillomavirus (HPV) vaccine use to prevent cervical cancer and its precursors. *CA Cancer J Clin.* 2007;57:7–28. [PubMed] [Google Scholar]
 29. Choudhury P, John TJ. Human papilloma virus vaccines and current controversy. *Indian Pediatr.* 2010;47:724–5. [PubMed] [Google Scholar]
 30. Choudhury P, Yewale V. Human papilloma virus vaccines and current controversy-reply. *Indian Pediatr.* 2011;48:248–9. [PubMed] [Google Scholar]