

A Study Report on Breast Cancer in Women

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ABSTRACT: As most of us look ahead into what we expect for our future, we will envision a life of good health, success and family. What if the health factor was not good? What if the woman in the family became ill with one of the most uprising and terminal illnesses. Breast cancer is a type of cancer which develops from a mutated gene. "One in 10 American women who live to be 70 develops breast cancer, with more than 180,000 new cases diagnosed each year." (Predicting breast-cancer, MSNBC Health News) Most of us, when thinking of the future do not take into account the idea of becoming ill. Yet today, this is indeed an issue that needs attention as early in life as possible. Doctors who work with breast cancer patient are now recommending that women as young as 15 and 16 years old should start with self-examination. But how effective is the self-exam, and other forms of early detection, and does it really help to save women from the disease? This is a question we hope to address in the following research.

I.Introduction

Breast cancer is a kind of cancer that develops from breast cells. Breast cancer usually starts off in the inner lining of milk ducts or the lobules that supply them with milk. A malignant tumor can spread to other parts of the body. A breast cancer that started off in the lobules is known as lobular carcinoma, while one that developed from the ducts is called ductal carcinoma. The vast majority of breast cancer cases occur in females. This article focuses on breast cancer in women.

Breast cancer is the most common invasive cancer in females worldwide. It accounts for 16% of all female cancers and 22.9% of invasive cancers in women. 18.2% of all cancer deaths worldwide, including both males and females, are from breast cancer.

Breast cancer rates are much higher in developed nations compared to developing ones. There are several reasons for this, with possibly life-expectancy being one of the key factors - breast cancer is more common in elderly women; women in the richest countries live much longer than those in the poorest nations. The different lifestyles and eating habits of females in rich and poor countries are also contributory factors, experts believe.

According to the National Cancer Institute, 232,340 female breast cancers and as well as about 39,620 deaths caused by the disease.

II.The Anatomy of a female breast

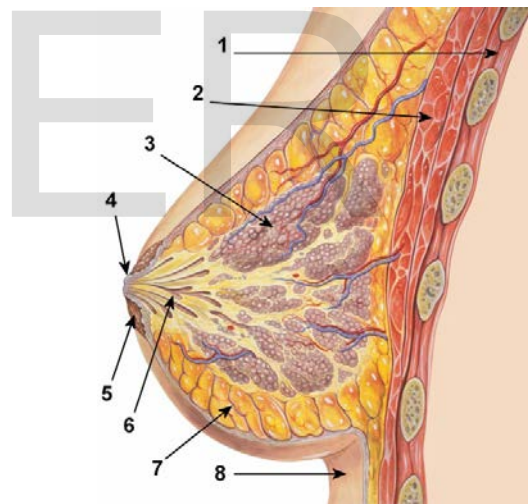


Fig: 1.1

1. Chest wall.
2. Pectoralis muscles.
3. Lobules (glands that make milk).
4. Nipple surface.
5. Areola.
6. Lactiferous duct tube that carries milk to the nipple.
7. Fatty tissue.
8. Skin.

A mature human female's breast consists of fat, connective tissue and thousands of lobules - tiny glands which produce milk. The milk of a breastfeeding mother goes through tiny ducts (tubes) and is delivered through the nipple.

The breast, like any other part of the body, consists of billions of microscopic cells. These cells multiply in an orderly fashion - new cells are made to replace the ones that died. In cancer, the cells multiply uncontrollably, and there are too many cells, progressively more and more than there should be.

Cancer that begins in the lactiferous duct (milk duct), known as ductal carcinoma, is the most common type. Cancer that begins in the lobules, known as lobular carcinoma, is much less common.

III. Types of Breast Cancer

3.1 Invasive breast cancer

The cancer cells break out from inside the lobules or ducts and invade nearby tissue. With this type of cancer, the abnormal cells can reach the lymph nodes, and eventually make their way to other organs (metastasis), such as the bones, liver or lungs. The abnormal (cancer) cells can travel through the bloodstream or the lymphatic system to other parts of the body; either early on in the disease, or later.

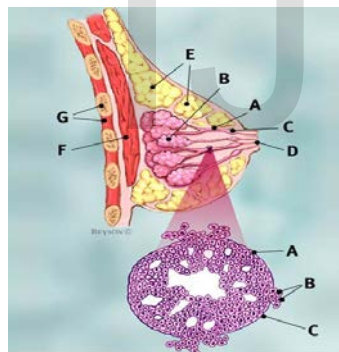


Fig.3.1 Ductal Carcinoma in situ (DCIS)

Normal breast with invasive ductal carcinoma (IDC) in an enlarged cross-section of the duct

Breast profile: A .Ducts B. Lobules C. Dilated section of duct to hold milk D. Nipple E. Fat F. Pectoralis major muscle G. Chest wall/rib cage

Enlargement A. Normal duct cell B. Ductal cancer cells breaking through the basement membrane. C. Basement membrane

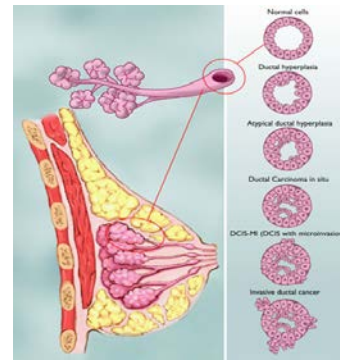


Fig 3.2 Range of Ductal Carcinoma in situ (DCIS)

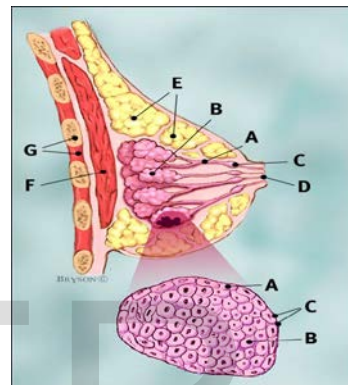


Fig 3.3 Lobular Carcinoma in situ (LCIS)

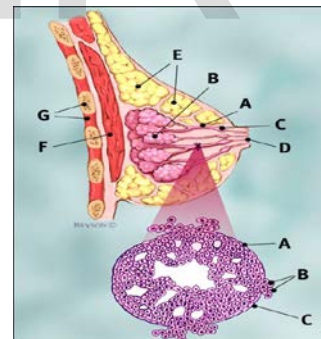


Fig 3.4 Invasive Ductal Carcinoma (IDC)

Breast profile: A .ducts, B. lobules, C. dilated section of duct to hold milk, D. nipple, E. fat, F. pectoralis major muscle G chest wall/rib cage

Enlargement: A. normal duct cells, B. ductal cancer cells breaking through the basement membrane, C. basement membrane

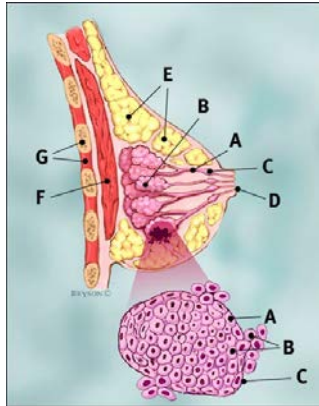


Fig 3.5 Invasive Lobular Carcinoma (ILC)

Breast Profile:

A .Ducts B. Lobules C. Dilated section of duct to hold milk D. Nipple E. Fat F. Pectoralis major muscle G. Chest wall/rib cage

Enlargement A. Normal duct cell **B.** Ductal cancer cells breaking through the basement membrane. **C.** Basement membrane

3.2 Non-invasive breast cancer

This is when the cancer is still inside its place of origin and has not broken out. Lobular carcinoma in situ is when the cancer is still inside the lobules, while ductal carcinoma in situ is when they are still inside the milk ducts. "In situ" means "in its original place". Sometimes, this type of breast cancer is called "pre-cancerous"; this means that although the abnormal cells have not spread outside their place of origin, they can eventually develop into invasive breast cancer.

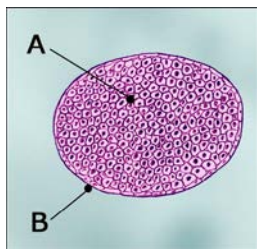


Fig 3.2.1 Solid

A cancer cells
 B basement membrane

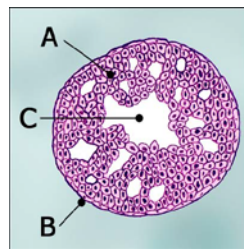


Fig 3.2.2. Cribriform

A cancer cells
 B basement membrane
 C lumen (center of duct)

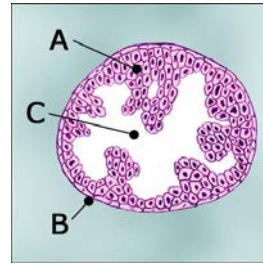


Fig 3.2.3 Papillary

A cancer cells
 B basement membrane
 C lumen (center of duct)

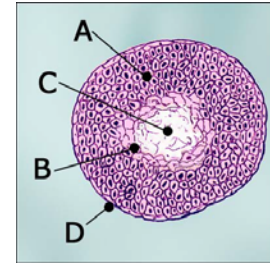


Fig 3.2.4 Comedo

A living cancer cells
 B dying cancer cells
 C cell debris (necrosis)

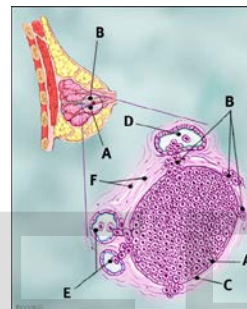


Fig 3.2.5

Vascular and Lymphatic Invasion Enlarge image

A blood vessel, B lymphatic channels,

Enlargement: A normal duct cells, B cancer cells, C basement membrane, D lymphatic channel, E blood vessel, F breast tissue

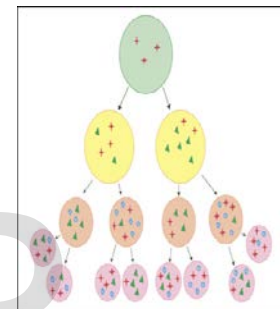


Fig 3.2.6

Tumor Heterogeneity

Tumor Heterogeneity: Every cell of any particular cancer originated from the same "mother" cell. One cell turns into two cells, two cells to four, and so on. By the time a one-centimeter cancer is detected, the millions of cells that make up the lump have become distant relatives, as different from each other as you may be from your third cousin twice removed. Such cancer cell diversity—represented by the red stars, blue circles, and green triangles in this illustration—is called "tumor heterogeneity." Because what kills one kind of cell might pass over another, we need treatments in combination or in sequence, working in different ways that TOGETHER may eliminate all of the cancer.

Symptoms of breast cancer

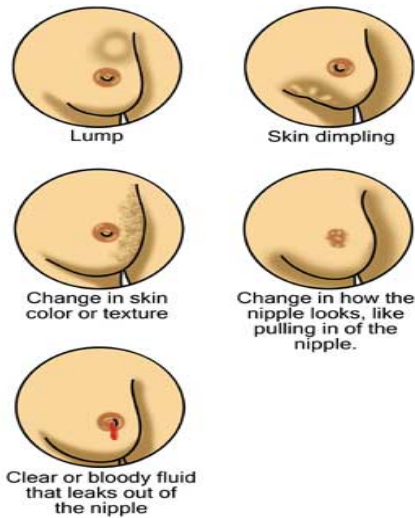


Fig 13.

Some of the possible early signs of breast cancer

- A lump in a breast.
- A pain in the armpits or breast that does not seem to be related to the woman's menstrual period.
- Pitting or redness of the skin of the breast; like the skin of an orange.
- A rash around (or on) one of the nipples.
- A swelling (lump) in one of the armpits.
- An area of thickened tissue in a breast.
- One of the nipples has a discharge; sometimes it may contain blood.
- The nipple changes in appearance; it may become sunken or inverted.
- The size or the shape of the breast changes.
- The nipple-skin or breast-skin may have started to peel, scale or flake.

IV. Causes of breast cancer

Experts are not sure what causes breast cancer. It is hard to say why one person develops the disease while another does not. We know that some risk factors can impact on a woman's likelihood of developing breast cancer.

1. **Getting older** - the older a woman gets, the higher is her risk of developing breast cancer; age is a risk factor. Over 80% of all female breast cancers occur among women aged 50+ years (after the menopause).

2. **Genetics** - women who have a close relative who has/had breast or ovarian cancer are more likely to develop breast cancer. If two close family members develop the disease, it does not necessarily mean they shared the genes that make them more vulnerable, because breast cancer is a relatively common cancer.

The majority of breast cancers are not hereditary.

Women who carry the BRCA1 and BRCA2 genes have a considerably higher risk of developing breast and/or ovarian cancer. These genes can be inherited. TP53, another gene, is also linked to greater breast cancer risk.

1. **A history of breast cancer** - women who have had breast cancer, even non-invasive cancer, are more likely to develop the disease again, compared to women who have no history of the disease.
2. **Having had certain types of breast lumps** - women who have had some types of benign (non-cancerous) breast lumps are more likely to develop cancer later on. Examples include atypical ductal hyperplasia or lobular carcinoma in situ.
3. **Dense breast tissue** - women with denser breast tissue have a greater chance of developing breast cancer.
4. **Estrogen exposure** - women who started having periods earlier or entered menopause later than usual have a higher risk of developing breast cancer. This is because their bodies have been exposed to estrogen for longer. Estrogen exposure begins when periods start, and drops dramatically during the menopause.
5. **Obesity** - post-menopausal obese and overweight women may have a higher risk of developing breast cancer. Experts say that there are higher levels of estrogen in obese menopausal women, which may be the cause of the higher risk.
6. **Height** - taller-than-average women have a slightly greater likelihood of developing breast cancer than shorter-than-average women. Experts are not sure why.
7. **Alcohol consumption** - the more alcohol a woman regularly drinks, the higher her risk of developing breast cancer is. The Mayo Clinic says that if a woman wants to drink, she should not exceed one alcoholic beverage per day.
8. **Radiation exposure** - undergoing X-rays and CT scans may raise a woman's risk of developing breast cancer slightly. Scientists at the Memorial

Sloan-Kettering Cancer Center found that women who had been treated with radiation to the chest for a childhood cancer have a higher risk of developing breast cancer.

9. **HRT (hormone replacement therapy)** - both forms, combined and estrogen-only HRT therapies may increase a woman's risk of developing breast cancer slightly. Combined HRT causes a higher risk.

10. **Certain jobs** - French researchers found that women who worked at night prior to a first pregnancy had a higher risk of eventually developing breast cancer. Canadian researchers found that certain jobs, especially those that bring the human body into contact with possible carcinogens and endocrine disruptors are linked to a higher risk of developing breast cancer. Examples include bar/gambling, automotive plastics manufacturing, metal-working, food canning and agriculture. They reported their findings in the November 2012 issue of *Environmental Health*.

- **Cosmetic implants may undermine breast cancer survival** - women who have cosmetic breast implants and develop breast cancer may have a higher risk of dying prematurely from the disease compared to other females, researchers from Canada reported in the *BMJ (British Medical Journal)* (May 2013 issue).

V. Breast Cancer Risk by Age

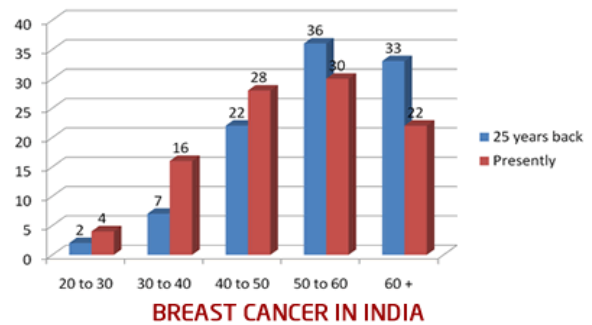
The risk of getting breast cancer increases with age. The table below shows the percentage of women (how many out of 100) who will get breast cancer over different time periods. The time periods are based on the woman's current age. For example, go to current age 60. The table shows 3.48% of women who are now 60 years old will get breast cancer sometime during the next 10 years. That is, 3 or 4 out of every 100 women who are 60 years old today will get breast cancer by the age of 70.

Percent of U.S. Women Who Develop Breast Cancer over 10-, 20-, and 30-Year Intervals According to Their Current Age, 2009–2011

Current Age	10 Years	20 Years	30 Years
30	0.44	1.88	4.07
40	1.45	3.67	6.83

50	2.29	5.56	8.76
60	3.48	6.89	8.90
70	3.88	6.16	N/A

Age shift: Breast cancer now more common in 30's and 40's



VI. STATISTICS OF BREAST CANCER IN INDIA

Breast Cancer

SOURCE: [HTTP://GLOBOCAN.IARC.FR](http://globocan.iarc.fr)

Estimated Incidence, Mortality and Prevalence Worldwide in 2012

Estimated numbers (thousands)	Cases	Deaths	5-year prev
World	1677	522	6255
More developed regions	794	198	3224
Less developed regions	883	324	3032
WHO Africa region (AFRO)	100	49	318
WHO Americas region (PAHO)	408	92	1618
WHO East Mediterranean region (EMRO)	99	42	348
WHO Europe region (EURO)	500	143	1900
WHO South-East Asia region (SEARO)	240	110	735
WHO Western Pacific region (WPRO)	330	86	1276
IARC membership (24 countries)	940	257	3614
United States of America	233	44	971
China	187	48	697
India	145	70	397
European Union (EU-28)	307	91	1407

SOURCE: [HTTP://GLOBOCAN.IARC.FR](http://globocan.iarc.fr)

International Agency for Research on Cancer



Metric	Country	Count	ASR/P
Incidence - Female	India	144,937	25.8
	United States of America	232,714	92.9
	China	187,213	22.1
Mortality - Female	India	70,218	12.7
	United States of America	43,909	14.9
	China	47,984	5.4
Prevalence (5yr) - Female	India	396,991	92.6
	United States of America	970,693	753.7
	China	697,327	129.3

For India, for the year 2012:

- 144,937 women were newly detected with breast cancer
- 70,218 women died of breast cancer
- $144937 / 70218 = 2.06 =$ round it off to 2. So roughly, in India, for every 2 women newly diagnosed with breast cancer, one lady is dying of it.

GLOBOCAN 2008 V/S GLOBOCAN 2012



Breast Cancer Incidence and Mortality Worldwide in 2008 Summary

Estimated numbers (thousands)	Cases	Deaths
World	1384	458
More developed regions	692	189
Less developed regions	691	269
WHO Africa region (AFRO)	68	37
WHO Americas region (PAHO)	320	82
WHO East Mediterranean region (EMRO)	61	31
WHO Europe region (EURO)	450	139
WHO South-East Asia region (SEARO)	203	93
WHO Western Pacific region (WPRO)	279	73
IARC membership (21 countries)	729	210
United States of America	182	40
China	169	44
India	115	53
European Union (EU-27)	332	89

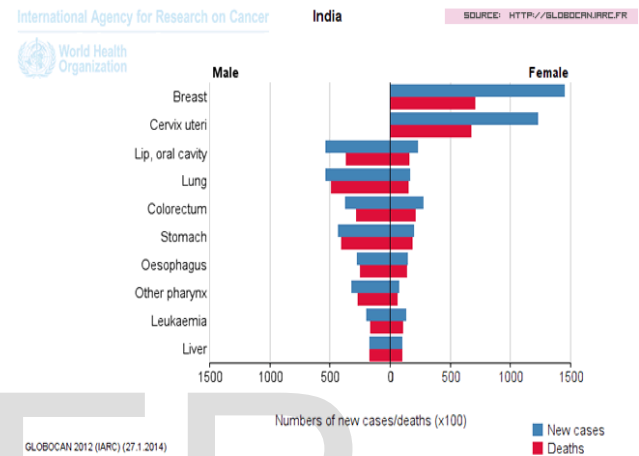
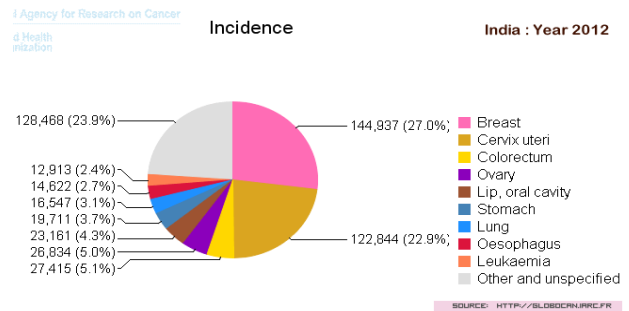
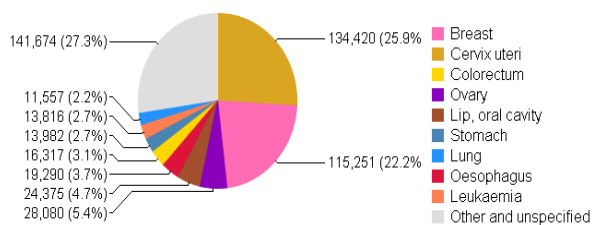
Breast Cancer

Estimated Incidence, Mortality and Prevalence Worldwide in 2012

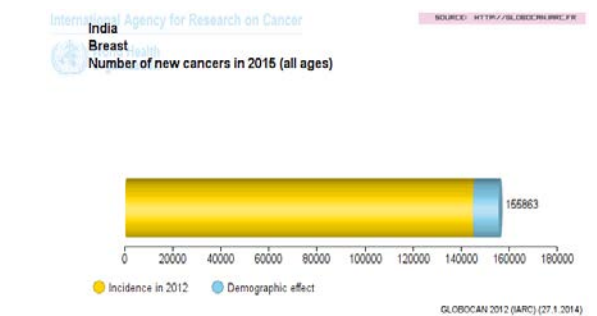
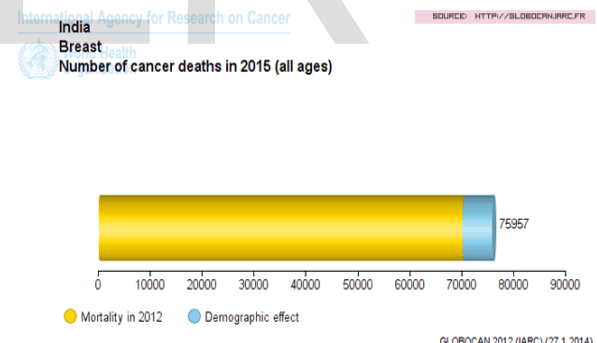
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BREAST CANCER V/S CERVICAL CANCER IN INDIA

International Agency for Research on Cancer World Health Organization Incidence India : Year 2008



WHO prediction for breast cancer in India



IX Enhancement

VII Treatment Options for Breast Cancer

A multidisciplinary team will be involved in a breast cancer patient's treatment. The team may consist of an oncologist, radiologist, specialist cancer surgeon, specialist nurse, pathologist, radiologist, radiographer, and reconstructive surgeon. Sometimes the team may also include an occupational therapist, psychologist, dietitian, and physical therapist.

The team will take into account several factors when deciding on the best treatment for the patient, including:

- The type of breast cancer
- The stage and grade of the breast cancer - how large the tumor is, whether or not it has spread, and if so how far
- Whether or not the cancer cells are sensitive to hormones
- The patient's overall health
- The age of the patient (has she been through the menopause?)
- The patient's own preferences.

The main breast cancer treatment options may include:

- Radiation therapy (radiotherapy)
- Surgery
- Biological therapy (targeted drug therapy)
- Hormone therapy
- Chemotherapy.

VIII CONCLUSION

In this paper we have presented a statistical study report on breast cancer which is more prevalent cause of death in middle age women. There is no way we can prevent breast cancer, but we can definitely detect it early and treat adequately. Only and ONLY with early detection, can we achieve a longer survival. And to make people aware of this early detection, it is going to need a lot of efforts, especially, since Indian society is so deep rooted in myths and alternative treatment and unusual illogical beliefs. So here, we have presented the anatomy, types of breast cancer, symptoms and the existing methods to treat the cancer so that, this would educate the women in understanding the breast cancer.

India is experiencing an unprecedented rise in the number of breast cancer cases across all sections of society, as are also other countries. It will take a lot of time to reverse this and get people on track. And the time is NOW. Presently, India already has one of the worst survivals from breast cancer, in the world (as you already saw from the numbers above); has the highest number of women dying from breast cancer in the world; and India ranks number one in the numbers of healthy life years lost (DALY - Disability Adjusted Life Years) due to breast cancer; and if this trend is not broken, I can't imagine how bad it will become. Looking at the plight of the situation in Indian women we would like to design an open source tool that would help the naïve users with a one stop information center regarding the breast cancer.

ACKNOWLEDGMENT

Authors wish to express their deepest gratitude to their supervisor Prof. Dr. Aruna Varanasi and Prof. Dr. G P L Jaya Sree who gave their support, guidance, encouragement and insights throughout the preparation of this paper. The authors also grateful to their Sreenidhi Institute of Science and Technology for their support and encouragement.

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