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**Adenocarcinoma: Morphological & Topographical spectrum: a two year analysis**

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**ORIGINAL RESEARCH**

**ABSTRACT**

**Aim**

To study adenocarcinoma of various sites and classify them into morphological categories according to International Classification of Diseases for Oncology (ICD-O, Third edition).

**Background**

The word cancer is enough to strike fear in the heart of any man because it is this one menace that researchers have been unable to curb. It is for this reason that many ideas are thought of and pursued with the hope of unraveling this mystery. In keeping with this a study delineating the morphological and topographical spectrum of adenocarcinoma was carried out in the Department of Pathology MGM Medical College and M Y Hospital Indore, MP, India.

**Material Methods**

A retrospective study of adenocarcinoma cases diagnosed during last 2 years, from January 2007 to December 2008 was carried out. ICD-O (3<sup>rd</sup>Ed.) was used as reference to categorize the cases according to anatomical site and morphology.

**Results**

Total 325 cases were included, out of which, the maximum, i.e. 221 cases (68%) of adenocarcinoma were found between third and fifth decades. The average for males was 48.1 years while for females it was 47.8 years. The frequency of adenocarcinoma was highest among those involving breast (56.50%), followed by those involving digestive system (30.24%). Regarding the topographical distribution of adenocarcinoma, the maximum number of cases (26.07%) of adenocarcinoma belonged to ICD-O category C-50 i.e. breast.

**Conclusion**

As far as the behavior pattern of the adenocarcinoma was concerned, most of the cases in our study were invasive type. Hence keeping this in mind the topographical spectrum prevalent in the area and having a high index of suspicion can prove to be useful for early detection, treatment, improved survival rate and reduced mortality in such cases.

**Key Words**

Adenocarcinoma, Glandular epithelium, ICD-O, Morphologic categories, Topographic spectrum.

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**INTRODUCTION**

Adenocarcinoma is the name of a broad category of cancers. This type of cancer occurs in cells that line organs such as the colon, lung, and breast. Cancer occurs when a cell undergoes changes that make it grow and multiply uncontrollably. The abnormal cells grow into a mass, which is called a tumor. Cancer cells from the tumor can break off and metastasize. In addition to spreading, adenocarcinoma also destroys the tissue around it.

Etymology- Adenocarcinoma (AD-in-o-kar-sin-O-ma). The term adenocarcinoma is derived from 'adeno' meaning, pertaining to a gland and 'carcinoma', which describes a cancer that has developed in the epithelial cells.<sup>1</sup> Structures within the body are covered with layers of tissue. One of these layers of tissue is called the epithelium. It covers the inside of hollow organs and milk ducts in the breast. Virtually all adenocarcinomas develop from adenomas. In general, the bigger the adenoma, the more likely it is to

become cancerous. For example, polyps larger than two centimetres (about the diameter of a nickel) have a 30-50 percent chance of being cancerous. When cancer occurs in one of the cells of the epithelium, it is called an adenocarcinoma. The cancer is also categorized by the kind of tissue from which it arose, such as breast or lung.<sup>2</sup> The neoplasm (new growth) may be benign or malignant. Epithelial tumors, which contribute a majority of both benign & malignant lesions, are derived from any of the three germ layers. Malignant tumors of epithelial or organ parenchymal derivation are referred to as carcinoma. If the cells are of glandular or ductular origin, they are referred to as adenocarcinoma- Cancer that begins in cells that line the inside of organs. These organs make substances like hormones or milk. Most breast cancers are of this type.<sup>3</sup> They begin in cells that make milk or in the cells that drain the breast milk. The nomenclature of tumor derived from specific type of epithelia is more direct, such as renal cell carcinoma & sweat gland carcinoma. The vast majority of colorectal cancers are adenocarcinomas. This is because the colon has numerous glands within the tissue. Normal colonic glands tend to be simple and tubular in appearance with a mixture of mucus secreting goblet cells and water absorbing cells. These glands are called glands because they secrete a substance into the lumen of the colon, this substance being mucus. The purpose of these glands is twofold. The first is to absorb water from the faeces back into the blood. The second purpose is to secrete mucus into the colon lumen to lubricate the now dehydrated faeces. This is crucial as a failure to lubricate the faeces can result in colonic damage by the faeces as it passes towards the rectum. Two important exceptions, melanoma & hepatoma are malignant tumors of melanocytes<sup>4</sup> & hepatocytes<sup>5</sup> respectively & should be designated as malignant melanoma & hepatocellular carcinoma. The basic schemes have several variations. Often however, designations are prefaced & convey more complete information, as in papillary serous cystadenocarcinoma, which defines the growth pattern of the tumor, or mucinous cystadenoma, which provides explicit information about differentiation.

#### AIMS AND OBJECTIVES-

The study of adenocarcinoma was undertaken with the following aims:

- To classify adenocarcinoma lesions into morphological and topographical categories according to International Classification of Diseases for Oncology (ICD-O, Third edition).
- To analyze the anatomical site distribution pattern and invasive and metastatic behaviour of adenocarcinoma lesions.

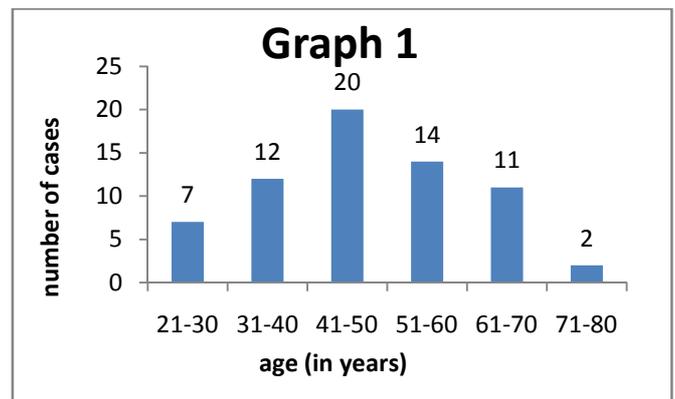
#### MATERIAL AND METHOD

This study includes cases of adenocarcinoma received in the department of Pathology, MGM Medical College, Indore, India from various Departments of M.Y. Hospital & Government Cancer Hospital, Indore, India between January

2007 and December 2008. A total of 325 cases were reported as adenocarcinoma during the period of two years. For this purpose the standard H & E stained slides of the lesions were retrieved & reviewed. Furthermore the anatomical distribution of the tumours was analyzed and they were then categorized into topographical classes and morphological categories according to ICD-O (third edition) after careful evaluation.

#### RESULT

Total three hundred twenty five cases were included in the study. Adenocarcinoma was more commonly observed in patients >30 years of age. The maximum number of patients (24.92 %) belonged to age group of 41-50 years. (Graph 1)

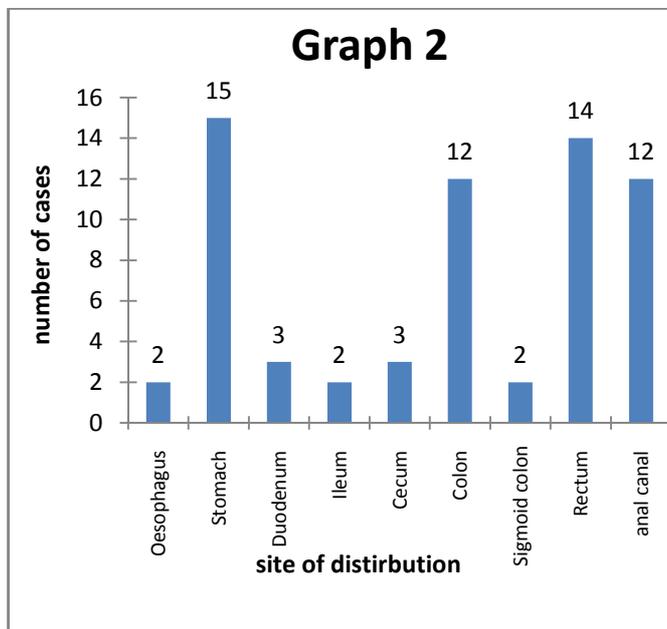


GRAPH 1 shows Age incidence in Gastrointestinal Adenocarcinoma.

Table No. 1 Incidence of adenocarcinoma in male and female with site distribution

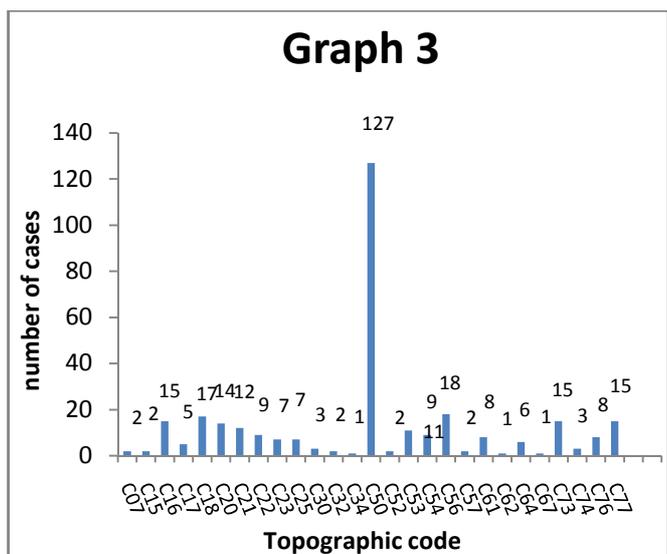
Site	Male No. Of cases	Female no. Of case	Total (%)
Breast	00	127	127 (39.00)
Digestive system	37	29	66 (20.30)
Female genital system	00	42	42 (13.00)
Thyroid	04	11	15 (5.30)
Lymph nodes	08	07	15 (4.60)
Liver	06	03	09 (2.70)
Male genital system	09	00	09 (2.70)
Gall bladder	06	01	07 (2.10)
Pancreas	03	04	07 (2.10)
Respiratory system	04	02	06 (1.80)
Kidney	04	02	06 (1.80)
Abdominal cavity	01	03	04 (1.20)
Adrenal gland	03	00	03 (0.90)
Salivary glands	02	01	03 (0.90)
Face	02	00	02 (0.60)
Urinary bladder	00	01	01 (0.30)
Bone	00	01	01 (0.30)
Gluteal region	00	01	01(0.30)
Elbow region	00	01	01 (0.30)
Total	89	236	325 (100)

The highest frequency of adenocarcinoma was observed in females (220) as compared to males (89). The frequency of adenocarcinoma presenting at our institution was highest among those involving the breast (39.00%), followed by those involving digestive system (20.30%). The respective involvement of female genital organ, & thyroid was 13%, & 05.30% in decreasing order of frequency. (Table No. 1)



GRAPH 2 shows Distribution patterns of Gastrointestinal Adenocarcinoma.

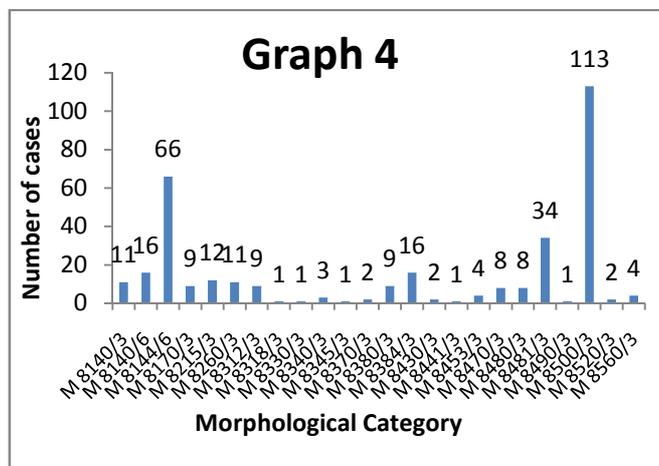
Out of all the Gastrointestinal adenocarcinoma cases, majority (23%) involved the stomach. Next in frequency were the cases involving rectum constituting 21.6%. Total cases involving the small intestine including duodenum ileum were 5(7.6%); the frequency of involvement of large intestine was 15(26%) and anal canal was 12(18.4%) cases. (Graph 2)



GRAPH 3 shows Distribution of Adenocarcinoma in ICD-O topographical categories.

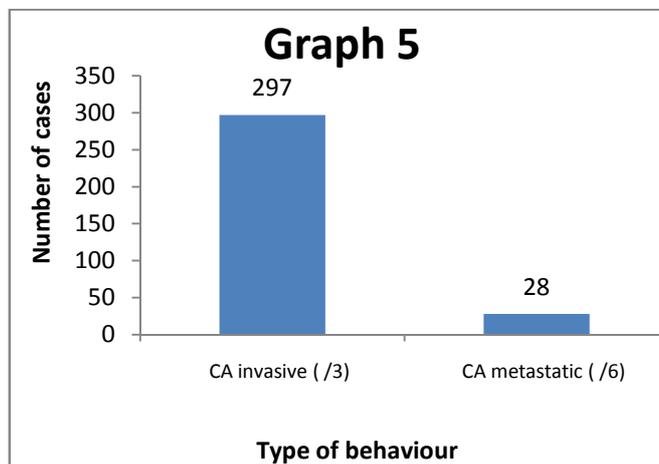
The maximum number of cases (40.00%) of adenocarcinoma belong to ICD-O category C-50 i.e. breast. Other

encountered categories were C-56 i.e. ovary with its frequency being 05.60%. Adenocarcinoma of colon (C-18), stomach(C-16), thyroid (C-73) and rectum (C-20) were constituted in decreasing order (05.23%, 04.60%, 04.60%, and 04.20%) cases. (Graph 3)



GRAPH 4 shows Morphological distribution of reported cases of Adenocarcinoma in ICD-O categories.

Highest frequency encountered among the studied cases was that of adenocarcinoma breast (infiltrating duct carcinoma NOS) (34.80%). This was followed in decreasing order by Adenocarcinoma intestinal type (16.30%) & adenocarcinoma NOS (10.20%). 28 cases (08.60%) were categorized as adenocarcinoma, metastatic category out of 325 cases. Rest of the categories constituted 30.10% portion of the cases. (Graph 4)



GRAPH 5 shows Distribution of behavior of reported cases of Adenocarcinoma.

Most of the reported cases of adenocarcinoma included invasive types i.e. 91.38% and rest of the cases were metastatic 8.62%. (Graph 5)

## DISCUSSION

### Age and sex incidence-

In our study, we found the maximum, i.e. 221 cases (68%) of adenocarcinoma between third and sixth decades of life (Graph 1). In the present study, the age of patients at first presentation ranged from 20 to 100 years. Ninety patients

were males and 220 were females; with a male: female ratio of 1: 2.5 (Table No. 1). In the study done by Lazcano-Ponce et al Gallbladder cancer was up to three times higher among women than men in all populations.<sup>6,7</sup> While in our study we found a frequency of adenocarcinoma of gall bladder six times higher in males as compared to females. In cases of Gastrointestinal adenocarcinoma a majority of patients (68.7%) were between 41 and 60 years of age; 31.8% were below the age of 40 years. There was a male preponderance (62.6%).<sup>8,9,10</sup> Our study correlates with this study in Gastrointestinal adenocarcinoma where a majority of patients (48.60%) were between 41 and 60 years of age. (Graph 1) Gastrointestinal adenocarcinoma was more commonly observed in patients >30 years of age. The maximum number of patients (30.30 %) belonged to age group of 41-50 years.

#### **Site distribution**

During the study, we did not come across any other records quoting the generalized distribution pattern of adenocarcinoma in the body. In our institute, the highest incidence of adenocarcinoma was diagnosed in breast (39.00%), followed by digestive system (20.30%). The respective involvement of female genital organs & thyroid was 13%, & 05.30%. Frequency was least (00.30%) for urinary bladder malignancy (Table No. 1). The frequency of metastatic deposits of adenocarcinoma in lymph nodes was 3.64%. Among endocrine glands commonest site was thyroid gland 04.90%.

#### **Distribution patterns of Gastrointestinal adenocarcinoma**

The incidence of oesophageal and proximal stomach adenocarcinomas<sup>11</sup> has recently risen more rapidly than any other malignancy in some countries; with average annual incidence increase of up to 17% for oesophageal adenocarcinoma. The rising incidence of proximal gastric cancer (i.e. gastric cardia, just below the stomach junction with the oesophagus) occurred despite decreases in the overall incidence of distal gastric adenocarcinoma.<sup>12,13</sup> In the present study of all the gastrointestinal adenocarcinoma cases, majority (23%) involved the stomach,<sup>14</sup> followed by cases involving rectum (21.6%). Total cases involving the small intestine including duodenum and ileum were 5(7.6%) and large intestine were 15(26%). Anal canal was affected in 18.4% cases. Adenocarcinoma was rarely encountered in oesophagus 2 (0.60%). (Graph 2).

#### **ICD-O: Morphological and topographical categories**

During the present study, we did not find any other such study about classifying adenocarcinoma into ICD-O categories according to the morphology & topography.

A) **Topographical distribution-** In our study, we found that maximum number of cases (40.00%) of adenocarcinoma belonged to breast with ICD-O category C-50. The next encountered category was

ovary, ICD-O category C-56 with its frequency being 05.60%. Adenocarcinoma of colon<sup>15</sup> (C-18), stomach (C-16), thyroid (C-73) and rectum (C-20) were found in decreasing order (05.23%, 04.60%, 04.60%, and 04.20%) respectively (Graph 3).

B) **Morphological distribution-** Highest frequency encountered among the studied cases was that of adenocarcinoma breast (infiltrating duct carcinoma NOS) (34.80%). This was followed in decreasing order by adenocarcinoma intestinal type (16.30%) & adenocarcinoma NOS (10.20%). Twenty eight cases (08.60%) were included in adenocarcinoma, metastatic category. (Graph 4).

#### **Distribution of behaviour of reported cases of adenocarcinoma**

During the present study, we did not come across any other such study relating to distribution of behaviour of adenocarcinoma. Behaviour of a tumour is the way it acts within the body. A tumour can invade the surrounding tissues (3), invasive, primary site); or even disseminate from its point of origin and begin to grow at another point (6, metastatic).<sup>16</sup> Most of the reported cases of adenocarcinoma included invasive types i.e. 91.30.0%. Rest of the cases with distant metastasis constituted 8.70% (Graph 5).

## **CONCLUSION**

In the present study, analysis of the topographical & morphological spectrum of adenocarcinoma shows maximum 221 cases (68%) of adenocarcinoma between third and fifth decades of life, with male: female ratio of 1:2.5. The predominant ICD-O topographical category was that of adenocarcinoma of breast. Majority of the females affected were >35 years of age.

This necessitates some efforts to increase the awareness among the general population about the disease and its early screening procedures and a high index of suspicion especially so if the patients fall into the age, sex, topographical and morphological categories. This will go a long way in achieving the ultimate goal of better and longer patient survival through early diagnosis.

It is further suggested that more such studies with larger number of cases should be undertaken in all Institutes mapping out their own frequencies and evolving strategies for combating this menace.

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## CONFLICTS OF INTEREST

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