

The Incidence Rate of Carcinoid Tumors in Appendectomy Specimens in Iran 1993-2003

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Abstract: Carcinoid tumors are the most common neoplasm of the appendix vermiform and appear to have increased in incidence in the past 20 years. In the cross sectional study 5048 appendectomy specimens at 10 years periods of year -1993 to 2003- were evaluated in pathology department. Twelve Carcinoid tumor of the appendix were identified (0.2%). There was female rate higher than male and they were most common diagnosed in the second and third decade of life. 75% of tumors were located in the distal third of appendix and all of them had less than one centimeter in diameter. Appendectomy alone was confirmed for all cases. Carcinoid tumors of appendix are good prognosis if size of it is under 1 Cm. It seems that they are more frequent in women and more common in young's. During appendectomy it's better to notify these tumors.

Key Words: Appendix, appendectomy, carcinoid tumors, Kerman, Iran

INTRODUCTION

Primary neoplasm of the vermiform appendix are presented in approximately 0.5-1% of appendectomy specimens and generally affect adults^[1-3] and Carcinoid tumors are the most common neoplasm of the appendix^[4-6]. The overall incidence of Carcinoid tumors has been estimated to be 1 to 2 cases per 1000 appendectomies in surgical specimens, but on the basis of both surgical specimens and autopsies, the incidence has been estimated to be 8 to 9 cases per 100,000 general populations^[6-8].

It seems that the incidence of Carcinoid tumors have increased in the recent years thus it's better that the characteristics of tumors identify, and explain by epidemiological studies. We decided to estimate the incidence of Carcinoid tumors in appendectomy specimens in Iran.

MATERIAL AND METHODS

Since January 1993 to January 2003, all appendectomy specimens, which had been operated in two general training hospital of Kerman medical Sciences University, examined in Pathology department. All Specimens fixed in formalin and cut in paraffin based block and stained with Hematoxylin-Eosin and reviewed by two pathologists. The final

diagnosis of Carcinoid tumor was based on the agreement reported by pathologists.

For all cases, clinico-demographically variables were gathered. SPSS 11.5 software was used to analyze the data. Pearson's Chi square test was chosen as the primary test for comparing difference between characteristics of patients. P value less than 0.05 was considered significantly.

RESULTS

During ten years period of time 5048 appendectomies were received in pathology departments and all of them reviewed by two pathologists. Twelve of these specimens had Carcinoid tumors. The incidence rate was 2.4 cases per 1000 appendectomies.

The frequency of Carcinoid tumor in both sexes was equal, six males and six females, and there

Table 1: Distribution of age group in all cases

Tumors Age	Carcinoid tumor	Without tumor
0-10	0	347
11-20	5	1826
21-30	4	1372
31-40	1	597
41-50	1	271
51-60	0	150
61-99	1	109

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Table 2: Pathology of appendix in tumoral and non-tumoral cases

Tumor Pathology	Carcinoid tumor	Appendices without tumor	Total
Normal	0	1663	1663
Acute	4	1461	1465
Suppurative	6	1469	1475
Gangrenous	1	359	360
Perforated	1	84	85
Total	12	5036	5048

was non significant difference between male and female in incidence of Carcinoid tumors. Nine patients were between 11 to 30 years old age (Table 1). All cases of Carcinoid tumors had pathologic feature of inflammation and one case was perforated (Table 2). Nine cases (75%) were located in the distal third of the appendix. Two cases were in the middle third and the one reminder was located at the base. The sizes of all tumors were less than 1 Cm in diameter and appendectomy was the only cured procedure for all patients.

DISCUSSION

Lubarsch, who found multiple tumors in the distal ileum of two patients' autopsy, first described Carcinoid tumors over 100 years ago^[6]. Carcinoid tumors have subsequently been reported in a wide range of organs but most commonly involve the lungs, and gastrointestinal tract. The appendix has been the most common site of Carcinoid tumors but a recent analysis of 8305 cases found an increase in proportion of small bowel carcinoids (28.7%) against 18.9 of appendix carcinoids and proportion of broncho-pulmonary Carcinoid tumors have been increased to 25.1%^[7]. These changes in relative incidence may be due in part to variation in the detection and reporting of Carcinoid tumors.

Appendiceal Carcinoid tumors were more common in women than in men^[6-10]. Our finding showed no difference between sexes but the incidence rate in females was greater than males (6/2311 > 6/2737). Their greater frequency in women has been attributed to an increased rate of incidental appendectomy in female gender but we omitted the incidental appendectomies in our study. However incidental appendectomy has become less common, recently and most Carcinoid tumors of appendix are founded during surgery for acute appendicitis^[9].

Recent study showed the most diagnosed age was second to third decades. The relatively young age at which appendiceal carcinoids are detected, may in part be due to the fact that appendectomies are perforated most often in young. In contrast at the other studies revealed that the age of incidence of Carcinoid tumors was higher^[9-12].

Some authors have postulated, however those Carcinoid tumors of appendix may regress with age^[4,13]. Less than 10% of appendiceal Carcinoids caused symptoms^[11] and in our results none of patients had Carcinoid symptoms but all of them had signs and symptoms of acute appendicitis preoperatively, because of 75% of tumors located in the distal third of the appendix.

Tumors appear to have increased in incidence the past 20 years^[7]. It's considerable to notify Carcinoid tumors because early diagnosis of the have very good prognosis. The five-year survival rate is 94% for patients with limited disease in appendix and diameter less than 1 cm.

It is better that all Carcinoid tumors in different organs assess and report for more information about Carcinoid tumors.

REFERENCES

1. Connor, S.J., G.B. Hanna and F.A. Frizella, 1998. Appendiceal tumors. Dis. Colon Rectum, 41: 75-80.
2. Deans, G.T. and R.A. Spence, 1995. Neoplastic lesions of appendix. Br. J. Surg., 82: 299-306.
3. Hananel, N., E. Powsner and Y. Woloch, 1998. Adenocarcinoma of the appendix, an unusual disease. Eur. J. Surg., 164: 859-62.
4. Moertel, C.G., M.B. Dockerty and E.S. Judd, 1968. Carcinoid tumors of the vermiform appendix. Cancer, 21: 270-8.
5. Godwin, J., 1975. Carcinoid tumors: An analysis of 2837 cases. Cancer, 36: 560-9.
6. Kulke, M.H. and R.J. Mayer, 1999. Carcinoid tumor. New Eng. J. Med., 340: 858-64.
7. Modlin, I.M. and A. Sandor, 1997. An analysis of 8305 cases of carcinoid tumors. Cancer, 79: 813-29.
8. Berge, T. and F. Linell, 1976. Carcinoid tumors: Frequency in a defined population during a 12-year period. Acta Pathol. Microbiol. Scand., 84: 322-30.
9. Roggo, A., W.C. Wood and L.W. Ottinger, 1993. Carcinoid tumors of the appendix. Ann. Surg., 217: 385-90.
10. Parkes, S.E., K.R. Muir M. al Sheyyab *et al.*, 1993. Carcinoid tumours of the appendix in children 1957-1986: incidence, treatment and outcome. Br. J. Surg., 80: 502-4.
11. Moertel, C.G., L.H. Weiland, D.M. Nagorney and M.B. Dockerty, 1987. Carcinoid tumor of the appendix: treatment and prognosis. N. Engl. J. Med., 317: 1699-701.
12. Bowman, G.A. and D. Rosenthal, 1983. Carcinoid tumors of the appendix. Am. J. Surg., 146: 700-3.
13. Shaw, P.A., 1990. Carcinoid tumors of the appendix are different. J. Pathol., 612: 1699-701.