

## STUDY ON THE PRECANCEROUS ESOPHAGEAL LESIONS OF RHESUS MONKEYS FROM TAIHANG AREA OF HIGH MORBIDITY OF ESOPHAGEAL

Zhang Hongxu 张红绪      Zhao Xiaojin 赵晓进      Hou Jinhuai 侯进怀  
Qian Weixing 千卫星      Lu Xitai 吕锡太      Zhang Huailin 仇怀林  
Zhu Dongming 朱东明      Xu Cunshuan 徐存栓

Department of Biology, Henan Normal University, Xinxiang Henan, 453002

Taihang Mountain Area is a high incidence area of esophageal cancer in Northern China. Among 124 Rhesus monkeys caught in the area, two cases of esophageal carcinoma were observed in 1990, and their symptoms and pathological morphological structures showed similarity to a well differentiated squamous carcinoma in human. At the same time, the cytological examinations were made on the 89 Rhesus monkeys of different sexes and ages, and the cases for normal (N), light proliferation (LP), high proliferation I (HP I) and high proliferation II (HP II) were 27 (30%), 35 (39%), 18 (21%) and 9 (10%), respectively. The proliferation of epithelium of esophagus in Rhesus monkeys changed with increasing age. The average age of the LP was 5.5 years old with the youngest aged 2 and the eldest aged 10; The average age of the HP I was 7.3 with the youngest aged 2.5 and the eldest over 10. The average age of the HP II was 8.1 with the youngest aged 4.5 and the eldest over 10. In all cases, the highest incidence was at the age of 6-10. It peaked at 10 and then decreased with years. The ecological environment (diet, water and soil) for Rhesus monkeys from the Taihang Mountain Area is the same as that for local residents in that area. In the region of a high incidence of human esophageal cancer, the morbidity of proliferation of esophageal epithelium and esophageal cancer was high not only for human but also for animals. And this indicated that the aetiology is closely connected with environment.

**Key words:** Precancerous lesions, Epidemiology, Rhesus monkey, Aetiology.

The esophageal carcinoma is one of the tumors with high morbidity in China. Its annual death-rate ranks it the second in those died of malignant tumors.<sup>1</sup> The incidence of the esophageal carcinoma has obvious regionalism. In particular, it is highest in the Taihang Mountain Area, the juncture of Henan, Hebei and Shanxi Provinces. There is a close connection between the incidence of esophageal carcinoma and the proliferation of esophageal epithelium.<sup>2</sup> The high proliferation (HP) of esophageal epithelium is the precancerous lesions of the esophageal carcinoma. These were few researches on the precancerous lesions of the esophageal carcinoma abroad.<sup>1</sup> In recent ten and odd years, there have had numerous studies of the proliferation of esophageal epithelium in China. However, there has been no reports in literature at home and abroad on the precancerous esophageal lesions of Rhesus monkeys from Taihang Mountain Area, a high incidence of esophageal cancer. In June, 1991, we made an cytological examination of the esophagus of 89 Rhesus monkeys from Taihang Mountain Area. The epidemiology investigation on animal tumors is one of the important ways to infer carcinogenic factors from the environment. The study of the law of occurrence and development of the esophageal carcinoma in high incidence area will

provide an important clue to clarify the aetiology and pathogenesis of human esophageal carcinoma and will be of great significance.

## MATERIALS AND METHODS

### Animals for Experiments

The 89 Rhesus monkeys for experiments were all caught in the Taihang Mountain Area (Huilong Mountain Area between Hui County and Lin County, and Ji Yuan Mountain Area of Henan Province). Quarantine proved that they were in proper health. Then those Rhesus monkeys were put in cages and raised in our University. Since then, they had not been made any experiment with, nor had we used any medicine on them. According to the method reported by Zeng Zhongxing, et al. (1984), the ages of Rhesus monkeys were determined and categorized into four groups (Table 1).

### Methods

The cell specimens were taken by the improved one-tube friction type air sac taker for esophageal cell

(provided by Cancer Institute of Chinese Academy of Medical Science) and were stained according to Papanicolaou's staining. The specimens were examined and graded with microscope by the grade method of smear cells for the epithelial proliferation of esophagus set up by Shen Qiong.<sup>3</sup>

Table 1. The groups of Rhesus monkeys

Groups	Ages	Total M+F	F	M	Range of weight (Kg)
I	1.5-3	20	10	10	
II	over 3-6	21	12	9	1.65
III	over 6-10	40	28	12	↓
IV	over 10	8	5	3	15.45
Total		89	55	34	

M: male; F: female

## RESULTS

The results of the cytological examination for the epithelium of esophagus of Rhesus monkeys from Taihang Mountain area are shown in Table 2. The comparison of different age groups is listed on Table 3.

Table 2. The results of the cytological examination of Rhesus monkeys from Taihang Mountain Area

Ages	Grades of cytology			
	N (%)	LP (%)	HP I (%)	HP II (%)
	No. of cases	No. of cases	No. of cases	No. of cases
1.5-3	8 (40%)	8 (40%)	3 (15%)	1 (5%)
over 3-6	7 (34%)	9 (42%)	4 (19%)	1 (4%)
over 6-10	9 (22%)	15 (37%)	10 (24%)	6 (15%)
over 10	3 (38%)	3 (38%)	1 (12%)	1 (12%)
Total	27 (30%)	35 (39%)	18 (20%)	9 (10%)

## DISCUSSION

Table 2 indicates that, of the 89 Rhesus monkeys examined in cytology, 27 was normal (N) (30%), 35, in light proliferation (LP) (39%), 18, in

high proliferation I (HP I) (21%) and 9, in high proliferation II (HP II) (10%); the total cases for HP were 27 (30%). These results were very close to LP 36% and HP 26% for human reported by Lin Peizhong, et al.,<sup>4</sup> who summed up the information of the general investigation (aged from 40 to 65) of the esophageal

cancer from 1983–1984 in Lin County of Taihang Mountain Area, a high incidence of human esophageal cancer, but they were much higher than HP 3.25% reported by Qiou Songliang<sup>2</sup> from the general survey of Yao Village in Lin County in 1974. In a word, the incidence of high proliferation of epithelium of

esophagus for Rhesus monkeys from Taihang Mountain area were higher than that of local residents (the result in Lin Peizhong's report was only for residents at age 40–65). Whether it is due to the smaller quantity of Rhesus monkeys we examined needs to be studied further.

Table 3. The relationship between the cytological examination of esophagus and the ages of Rhesus monkeys from Taihang Mountain Area

Items \ Ages	1.5–3	over 3–6	over 6–10	over 10	Average age $\bar{x}$ (y)	Total
N	8 (30%)	7 (26%)	9 (33%)	3 (11%)		27
LP	8 (23%)	9 (26%)	15 (43%)	3 (9%)	5.5	35
HP I	3 (17%)	4 (22%)	10 (56%)	1 (16%)	7.3	18
HP II	1 (11%)	1 (11%)	6 (67%)	1 (11%)	8.0	9

When the sufferers of proliferation of epithelium of esophagus of Rhesus monkeys were grouped according to ages, we saw that the morbidity of the disease was increasing with advancing of the age (Table 3). It should be noted that the incidence of LP and HP for Rhesus monkeys was increasing year by year before age of 10. The average age of LP was 5.5 years old with the youngest aged 2 and the eldest aged 10; The average age of the HP I and HP II were 7.3 and 8.1 years old, respectively. The youngest for HP I and HP II were at the age of 2.5 and 4.5 respectively, while the eldest for HP I and HP II were 10 and over 10. In all cases, the highest incidence was at the age of 6–10. It peaked at 10 years old and reduced after 10. But the average age of two Rhesus monkeys died of esophageal carcinoma was about 9. This had something in common with that reported by Qiou Songliang.<sup>2</sup> He reported that the incidence of proliferation for human increased before the age of 50 and decreased after 50 with years and that the morbidity of cancer increased with years mainly after 50. This fact indicated that there were connection between the proliferation of epithelium of esophagus, esophageal carcinoma and ages, and further proved that there were parallel relation between the proliferation of epithelium of esophagus and esophageal carcinoma.

The epidemiology investigations on animal tumors showed that there existed high proliferation of epithelium of esophagus and papilloma in the proventriculus in rats, papillary tumor in the esophagus of

sheep, asses and cattle,<sup>3</sup> pharyngo-esophageal squamous cell carcinoma in chicken<sup>5</sup> and esophageal squamous cell carcinoma in Rhesus monkeys.<sup>6</sup> Among all the animals mentioned above, only Rhesus monkeys had intimate relation with human and the ecological environment (diet, water, soil) for them is the same as that for local residents in that area. In the region of a high incidence of human esophageal cancer, the incidence of the proliferation of esophageal epithelium and esophageal cancer was high not only for human but also for animals. The high morbidity of the precancerous lesions and esophageal carcinoma for both human and animals reveals that there is an important relation between the aetiology and the environment. Therefore, it is very significant to study the law of occurrence and development of the esophageal carcinoma in the high incidence area for clarifying the aetiology and pathogenesis of the disease in the area.

## REFERENCES

1. 林培中, 陆士新, 张金生, 等. 食管癌前病变(食管上皮增生)的研究概况. 中华肿瘤杂志 1983; 5:391.
2. 裘宋良. 食管的癌前病变. 中华肿瘤杂志 1980; 2:79.
3. 河南医学院. 食管癌. 第一版. 北京: 人民卫生出版社. 1983; 136–137.
4. 林培中, 张金生, 戎振鹏, 等. 食管癌前病变的药

- 物阻断性治疗. 中国医学科学院学报 1990; 12:235.
5. 中国医学科学院林县食管癌防治研究队. 河南林县母鸡的咽 — 食管鳞癌与食道鳞癌. 动物学报 1973; 19:303.
6. 张红绪, 仇怀林, 朱东明, 等. 食管癌高发区太行山猕猴食管癌的初步研究. 中华肿瘤杂志 1992; 14:411.

## A CASE REPORT OF PRIMARY CARDIAC RHABDOMYOSARCOMA

Zhang Zhenhua 张珍华      Chen Ren 陈韧

*The First Teaching Hospital, Xi'an Medical University, Xi'an 710061*

A 30-year-old woman was referred to our hospital for recurrent episodes palpitate and shortness of breath for 3 months, symptoms deteriorated for 1 week. Physical examination: The general condition was good. Orthopnea, no lymphadenopathy, Cyanosis, or venodilation was detected. Breathe sound was rough, moist rales were heard in the bottom of the lung. apex-beat was in the normal range. Heart rate 110/m, sinus regular rhythm, II° diastolic murmurs could be heard in the apex area, rough, no conduction,  $P_2 > A_2$ . There were no peripheral vascular signs. No edema in both legs. Laboratory test indicated: Erythrocyte Sedimentation rate of 84 mm/h. Electrocardiogram showed pulmo P wave, low voltage tendency. UCG showed left atrium enlargement. There was 4 cm × 5.1 cm occupied sound image and revealed two mucago dark areas independent to heart beats. No obvious pedicel like echo. The clinical diagnosis was left atrium myxoma. During the operation, it was found that the left atrium was filled with tumor. The tumor like the ginger, fragile as rotten meat, no adhesion to the atrial septum. No pedicel. The base was on the right side of the left atrium. The pulmonary vein was filled with tumor tissues. Curedted tumor tissues of the left atrium. Left auricle and pulmonary vein. The place where the right superior pulmonary vein meet with the left atrium was rupture. Sutured it by adding cushion. Removed tumor tissues about 100 g. Pathological diagnosis: Left atrium pleomorphic rhabdomyosarcoma with

haemorrhage and necrosis.

### DISCUSSION

The incidence of primary cardiac tumor is very low.

The statistical data of autopsy shows that the incidence is about 0.0017%–0.05%. Still the primary cardiac rhabdomyosarcoma is even rare. In 1949, each reported that there were 8 (0.02%) rhabdomyosarcoma cases in 422 primary cardiac and pericardiac tumor. The primary cardiac rhabdomyosarcoma can be divided into 3 entities: pleomorphic type, alveolar type and embryonal type. The tumor can occur in any site of the heart. The patient age is usually between 30–40 years old. No definite pre-ponderance between male and female. The clinical symptoms varied according to the site where tumor occur and infarction. The initial symptom of this patient was left heart failure, episode paroxysmal palpitate, shortness of breath, coughing and hemoptysis. They are consistent with the literature reports. UCG and MRI are helpful to the diagnosis. But the final diagnosis still needs the pathological confirmation. 21 days after the palliative operation, the patient died of respiratory and circulation failure. Even so, aggressive and complete surgical resection still seems to be the most effective therapeutic method for a primary rhabdomyosarcoma.

(Accepted February 6, 1996)