

Elimination rate of AFP after surgical operation and prognosis of the patients with hepatoblastoma and hepatoma

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SUMMARY

- 1) The half elimination rate of AFP may be a good indicator for the prognosis of operations of AFP producing tumors.
- 2) The half elimination rate of AFP is about 3.7 days.
- 3) In clinical application, titration of AFP carried out every 4 days is necessary for the evaluation of chemotherapy and operations.

INTRODUCTION

α -1-Fetoprotein (AFP) was frequently observed in the sera of patients with hepatoma, hepatoblastoma, embryonal cell carcinoma and teratocarcinoma^{1,2}. A detection method and titration method were developed for the diagnosis of AFP producing malignant diseases. As cited in other articles, an increase in sensitivity, showed a decrease in specificity³. A single radial immunodiffusion (SRID) method over 400 ng/ml was found suitable for clinical diagnosis⁴. As mentioned in the literatures, AFP was produced by hepatoma cells and other cells in which sera was positive for AFP. Hence, the fluctuations of AFP by chemotherapy and by surgical operation should coincide with the effectiveness and prognosis thereof.

From these standpoints, the AFP content of the sera after operation were determined by SRID method. This paper deals with the elimination rate of AFP among four patients and the relation between the elimination rate and prognosis was discussed.

MATERIAL AND METHOD

Titration of AFP: Several sera of four patients with hepatoma and hepatoblastoma before and after radical operation were titrated by a SRID method which was developed in our laboratory. The amount of AFP was

expressed by unit per milliliter which was introduced by the author. Recently it was revealed that one milligram of the purified AFP was equivalent to 3,000 units.

RESULTS

As shown in Fig. 1, the elimination curves of the four patients after operation were obtained by repeated titration of AFP.

Among the four cases, half elimination rates of two cases, S.I. a 3 year-old-male hepatoblastoma case and T.H. a 62 year-male hepatoma case,

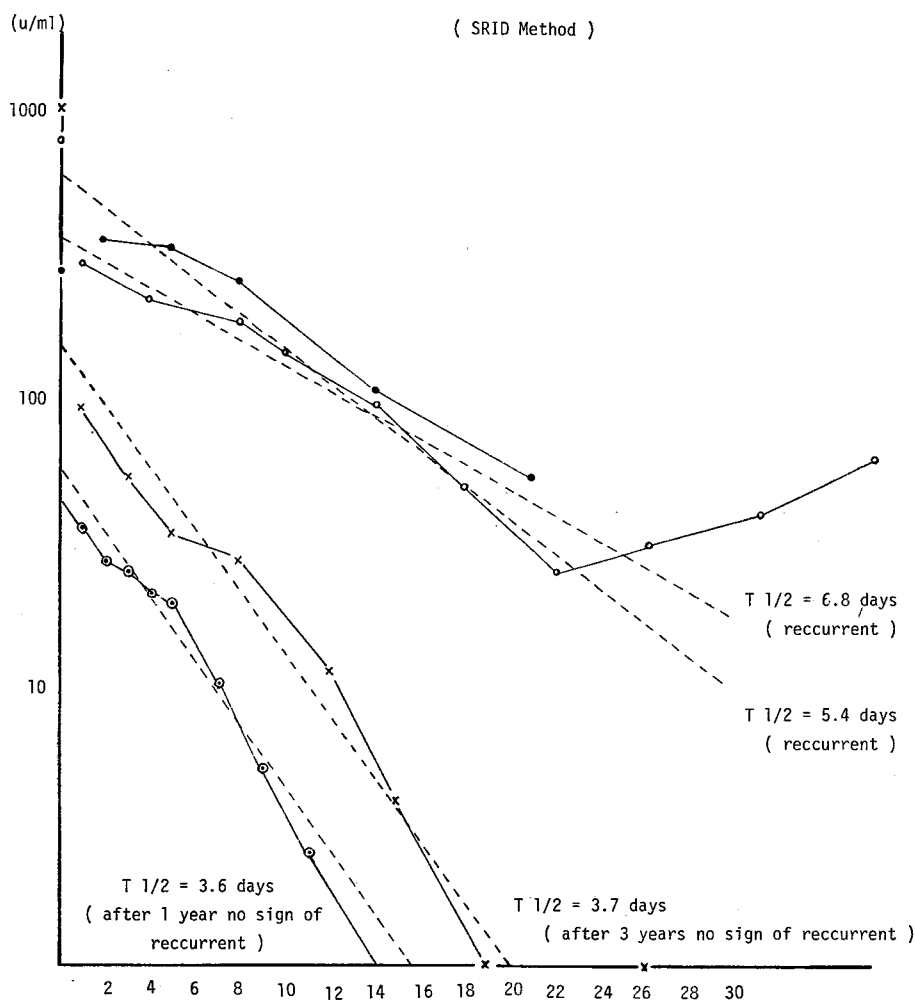


Fig. 1. Elimination rate of α_1 -fetoprotein in serum and prognosis of patients with hepatoma and hepatoblastoma.

were within 4 days, namely 3.7 and 3.6 days respectively, while in the other two cases, I.O. a 3 year-old-female hepatoma and T.Y. a 1 year-old-male hepatoblastoma case were over 4 days, namely 5.4 and 6.8 days respectively.

It is striking that the two cases within 4 days of the half elimination rate were still alive one year after operation. Among the two cases within 4 days of the half elimination rate, one case with hepatoblastoma did not show any recurrent sign of the hepatoblastoma 3 years after operation.

On the other hand, the other two cases with over 4 days of half elimination rate died of recurrent tumor within 6 months. Especially in the case with the longest half elimination rate, AFP did not disappear and the amount increased again 26 days after the operation. The increasing rate was logarithmic.

DISCUSSION

The half elimination rate and prognosis after operation showed a fair coincidence in the four operated cases. The cases of half elimination rate within 4 days, especially 3.7 days, were expected to recover, because of the lack of re-elevation of AFP, even by titration with radioimmunoassay. As in the reports of Gitlin⁵⁾ and Kotoyori⁶⁾, the half elimination rate of the new born and the premature babies was also within 4 days.

From the reports and observation, the half elimination rate were expected to be within four days. Comparing these results, two cases of the half elimination rate within 4 days may have been simply caused by the elimination of the circulating AFP at the time of operation. In the other two cases of the half elimination rate over 4 days, the influence of the newly produced AFP of the remnant tumor should be present, even though radical operations were carried out. In fact, the recurrence of tumor was manifested later on.

Hence the longer half elimination rate of AFP than 4 days might indicate the presence of a remnant tumor with AFP production.

However the half elimination rate differed according to the initial amount of AFP. In fact, the half elimination rate was slightly lengthened to 5.1 days in a range measurable by radioimmunoassay⁷⁾. This might be influenced by possible AFP production in individuals. Hence we were mainly concerned with AFP values over 1.2 u/ml (ca. 400 ng/ml) which might not be influenced by possible production of AFP production in individuals and which could be estimated by the SRID method.

From the clinical studies, repeated AFP titration was found useful

for the evaluation of results of chemotherapy and operations. Especially titration of AFP every 4 days may provide good information for clinical diagnosis and prognosis.

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