Relation between the Increase of Alpha Fetoprotein Serum Level and the Size of Hepatocellular Carcinoma in Multi Slice Computed Tomography Examination

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Abstract

Background: Hepatocellular carcinoma can be diagnosed based on the result of Multi Slice Computed Tomography (MSCT) imaging only without histology result confirmation

Objective: The aim of the study is to find out the relation between the increase of alpha fetoprotein serum level and the size of hepatocellular carcinoma in MSCT examination in Dr. Soetomo Teaching Hospital.

Methodology: This is a retrospective, observational analytic study which uses secondary data. There were 50 samples with hepatocellular carcinoma. The data were collected from the medical records of MSCT subjects and AFP (Alpha-fetoprotein) serum level result. All recorded and analyzed statistically. Results: Of all the 50 samples, 41 are male (82%) and 9 are female (18%). The ages of the samples ranged from 19 to 76 years old with the majority of 51-60 years old in 15 patients (30%). Most distribution of AFP serum level was >400 ng/ml with 29 patients (58%) and tumor size of >5 cm with 49 patients (98%). The analysis using Spearman correlation test shows the correlation value p = 0.418 (p >0.05).

Conclusion: There was no relation is found between the increase of alfa fetoprotein serum level and the size of hepatocellular carcinoma in MSCT examination.

Keywords: *Hepatocellular carcinoma, Alfa fetoprotein, Multi Slice-CT, Tumor size.*

Introduction

Hepatocellular carcinoma (HCC) is the most common primary malignancy of the heart [1,2]. It is ranked fifth in the world following lung cancer, prostate cancer, colorectal cancer, and stomach cancer. It is also ranked as the world's second biggest cause of death after lung cancer with the death rate of 745,000 per year4 [3,4]. HCC is different from the other types of carcinoma since it is able to be diagnosed based on multi slice computed tomography (MSCT) imaging result only without histology result confirmation [5–7]. Abdominal MSCT examination is a radiology examination using X-ray and computer[4]. In hepatocellular carcinoma patients, abdominal MSCT is conducted in 4 phases: pre-contrast, arterial phase, venous phase, and delayed phase [4,8]. Non-ionic contrast media is injected intravenously to see the hyper-vascular lesions of hepatocellular carcinoma inarterial phase and rapid wash out in venous phase [2,9]. Therefore the researchers aimed to find out the relation between the increase of alfa fetoprotein serum level and the size of hepatocellular carcinoma in Dr. Soetomo Hospital Surabaya.

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Material and Method

Subject

The subject of this study is all abdominal MSCT patients of radiology installation in diagnostic center building Dr. Soetomo General Hospital Surabaya during January to December 2014 whose hepatocellular carcinoma results has never been treated and already has AFP (Alpha-fetoprotein) serum level.

Method

This research is observational analytical with retrospective study (secondary data from Medical records). This study involved 50 abdominal MSCT patients whose hepatocellular carcinoma results have never been treated and have AFP serum level. The criteria for this study is that all abdominal MSCT patients with hepatocellular carcinoma results who come for the first time and have never undergone therapy and have AFP serum level examination results.

Two variables were used in this study as research variables: alfa fetoprotein serum level and tumor size in MSCT. The data were collected from the medical records of MSCT patients with hepatocellular carcinoma in Radiology Installation, Diagnostic Center Building, Dr. Soetomo General Hospital Surabaya. The data were categorized based on the research criteria and AFP serum level result. All documentation results were gathered for data tabulation and statistical analysis later. Analysis test in this study was conducted using Spearman test. Statistical measurement was done using SPSS software. The authors have obtained ethical clearance permission from Medical Research Ethics Committee of Dr. Soetomo General Hospital.

Result

Research Subjects' Characteristics

Table 1. Group Distribution Based on Gender

Gender	Frequency	Percentage
Male	41	82%
Female	9	18%
Total	50	100%

The result of this study showed that there were 50 abdominal MSCT patients (n = 50) with hepatocellular carcinoma results who came from the first time, had never undergone therapy, and had AFP serum level examination results in Radiology Installation of Dr. Soetomo General Hospital Surabaya in the period of January 2014 to December 2014. Of all the 50 patients, 41 were male (82%) and 9 were female (18%), all of them met the criteria, as shown in Table 1.

Table 2. Group Distribution Based on Age

Age	Frequency	Percentage
11- 20 years old	1	2%
21- 30 years old	2	4%
31- 40 years old	8	16%
41 – 50 years old	14	28%
51 – 60 years old	15	30%
61 – 70 years old	7	14%
71 – 80 years old	3	6%
Total	50	100%

In this study, the distribution of hepatocellular carcinoma based on AFP level are AFP level of <20 ng/ml with 11 patients (22%), 20-400 ng/ml with 10 patients (20%) and >400 ng/ml with 29 patients (58%). The most distribution is found in tumor size of >5 cm with 49 patients (98%), while tumor size of 3-5 cm has 1 patient (2%). No patient is found with tumor size of <3 cm.From the data, it can be inferred that there is a significant difference between tumor size of <3 cm and >5 cm. The age group of hepatocellular carcinoma patients in this study was ranged between 19-76 years old. The most frequency is found in the age range of 51-60 with 15 patients (30%), followed by the age range of 41-50 with 14 patients (28%) (Table 2).

Table 3. Group Distribution Based on AFP Level		
AFP Level	**Frequency**	**Percentage**
I	11	22%
II	10	20%
III	29	58%
Total	50	100%

Hepatocellular carcinoma characteristics based on AFP level was shown in Table 3.FP level and divided into 3 categories [3,10]; In this study, the most distributed was found in AFP level category III (>400 ng/ml) with 29 patients (58%), while category II (20-400 ng/ml) had 10 patients (20%) and category I (<20 ng/ml) had 11 patients (22%).

Table 4. Group Distribution Based on Tumor Size		
	Frequency	**Percentage**
II	1	2%
III	49	98%
Total	50	100%

The result of hepatocellular carcinoma distribution data analysis based on tumor size was shown in Table 4. In this study, the most distribution was found in tumor size of >5 cm with 49 patients (98%), followed by tumor size of 3-5 cm with 1 patient (2%). No patient was found with tumor size of <3 cm.

Table 5. Spearman Test Result					
		Value	**Asymp. Std. Error(a)**	**Approx. T(b)**	**Approx. Sig.**
Interval by interval	Pearson's R	-112	-0,057	-779	0,44(c)
Ordinal by ordinal	Spearman Correlation	-117	0,059	-818	0,418(c)
N of Valid Cases		50			

Statistical data analysis using Spearman's correlation statistic test Spearman Correlation Test shows the correlation value p = 0,418 (p >0.05) which indicated no relation between the increase of alfa fetoprotein level and the size of hepatocellular carcinoma in MSCT examination.

Discussion

In this study, there were 50 hepatocellular carcinoma patients in January to December 2014 who meet the research criteria, with sex-based distribution of 41 males (82%) and 9 females (18%) and the ratio between male and female is 4:1. This is in line with several previous studies mentioning the ratio between male and female of 4:110. In this study, the most age is 51-60, with the age range of 19-76 and the mean age of 49. This finding is in accordance with the previous study [2,9,11].

The number of hepatocellular carcinoma patients in this study with tumor size of <3 cm is much less (none) compared to those of with tumor size of >5 cm. This is probably because the majority of patients who come to Radiology Installation Dr. Soetomo Teaching Hospital Surabaya in the period of January to December 2014 are already in intermediate or advance stage (where the

tumor size is 3-5 cm or >5 cm) when are diagnosed. Therefore, no patient is found in early stage with small tumor size or <3 cm and there are variations of time range between AFP and MSCT examination result.

In this study, tumor with high AFP might appear small in size, but there is also tumor with low AFB yet has big size. This might due to the variations of hepatocellular carcinoma tumor that do not generate AFP or generate antigen that does not react with antibody used in immunoassay [12–14].

Conclusion

No relation between alfa fetoprotein serum level and the size of hepatocellular carcinoma in MSCT examination, p = 0.418 (p >0.05). From the result of this study which has been statistically analyzed using Spearman's correlation statistic test (Spearman Correlation Test), the correlation value is p=0.418 (p >0,05) which indicates no relation between the increase of alfa fetoprotein serum level and the size of hepatocellular carcinoma in MSCT test.

Conflict of Interest : There is no conflict of interest

Source of Funding : This study is self-funded

Ethical Clearance : This study was approved by Ethical Commision of Medical Research, Faculty of Medicine, Universitas Airlangga.

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