

長庚大學醫學院臨床醫學研究所

畢業生研究成果

畢業年度：108學年度第學期

畢業研究生：連昭明

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畢業論文題目（中文）：對於B型肝炎帶原者早期肝細胞癌篩檢策略的成本效益分析

畢業論文題目（英文）：Test strategy for hepatocellular carcinoma surveillance: A cost-effectiveness analysis

Background: Hepatocellular carcinoma is the fifth most common cancer with high mortality. The most common risk factor is chronic hepatitis B infection. Ultrasound surveillance is the test of choice to detect small HCC of less than 3cm in diameter, which can always be treated with curative intent. However, this test is operator-dependent and false negative examinations do occur. How often surveillance ultrasound should be performed has never been studied by rigorous cost-effectiveness analysis.

Methods: Using a Markov cohort model, we evaluated the cost-effectiveness of two surveillance strategies for asymptomatic HBV carriers without cirrhosis, 6-monthly versus 12-monthly ultrasound-alone HCC surveillance. Parameter estimates were obtained from literature reviews. Uncertainty was explored using sensitivity analyses.

Results: Our results showed a 6-monthly surveillance strategy was not cost effective (incremental cost-effectiveness ratio (ICER) of NT9,573,758.22 per quality-adjusted life year gained (QALY)) at a willing-to-pay threshold of NT2,451,960.00 per QALY, as compared to a 12-monthly alternative. The most important parameters that impact on ICER were cancer annual incidence, followed by dis-utilities incurred from tumor therapy. A 6-monthly surveillance would be cost effective when cancer annual incidence reaches 2.0%. Tumor doubling time had a significant but paradoxical role.

Conclusions: A 12-monthly ultrasound-alone HCC surveillance is favored in asymptomatic HBV carrier without cirrhosis from the government's perspective. As cancer risk increases with aging and disease progression, a cost-effectiveness re-evaluation for a 6-monthly HCC surveillance may be desired. Studies are needed to investigate tumor growth kinetics of small HCC of 1.0 to 3.0cm in diameter for future cost-effectiveness analysis.

Keywords: Hepatocellular carcinoma, HBV carriers, ultrasound surveillance, Markov cohort model, cost-effectiveness analysis, ICER, willingness-to-pay threshold

Ultrasound Surveillance 12- vs 6-monthly in Different Models

Model	Strategy	Cost, NTD	Effectiveness, QALY	ICER
Markov cohort at constant HCC incidence	12m surveillance	33834.14	18.28	
	6m surveillance	61789.76	18.28	13526447.49
Markov cohort at age-stratified HCC incidence	12m surveillance	36065.87	18.27	
	6m surveillance	63947.94	18.27	9573758.22
Microsimulation at age-stratified HCC incidence	12m surveillance	35473.83	18.12	
	6m surveillance	63578.52	18.12	14740821.24

