COST-EFFECTIVENESS ANALYSIS OF NONINVASIVE SCORES FOR THE PREDICTION OF NON-ALCOHOLIC FATTY LIVER DISEASE AMONG METABOLIC SYNDROME PATIENTS

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OBJECTIVES:

To evaluate cost-effectiveness of these scores for prediction of NAFLD among MetS patients in Thailand as one of low- and middle-income countries

METHODS:

The sensitivity and specificity of fatty liver index (FLI), lipid accumulation product (LAP), hepatic steatosis index (HIS), and NAFLD-MS score were analyzed among a total of 499 Thai MetS patients. A decision tree coupled with Markov model was used to estimate lifetime costs and health benefits of these scores using a societal perspective. The input parameters were obtained from Thai health care databases and systematic literature review. Results were compared between 4 scores and reported as incremental cost-effectiveness ratios (ICERs) in 2017 United States Dollars (USD) per quality-adjusted life year (QALY) gained.

RESULTS:

NAFLD was detected in 68% of total MetS patients. At the Thai ceiling threshold of societal willingness-to-pay of 4,706 USD, at low cutoff point; screening ultrasonography for moderate- and high-risk groups, all scores were cost-effective when compared to no screening. HSI is the best buy option with an ICER of 2,748 USD/QALY gained. However, at high cutoff point; screening ultrasonography for only high-risk group, LAP is better than other scores with an ICER of 2,073 USD/QALY gained.

Table 1 *Input parameters*

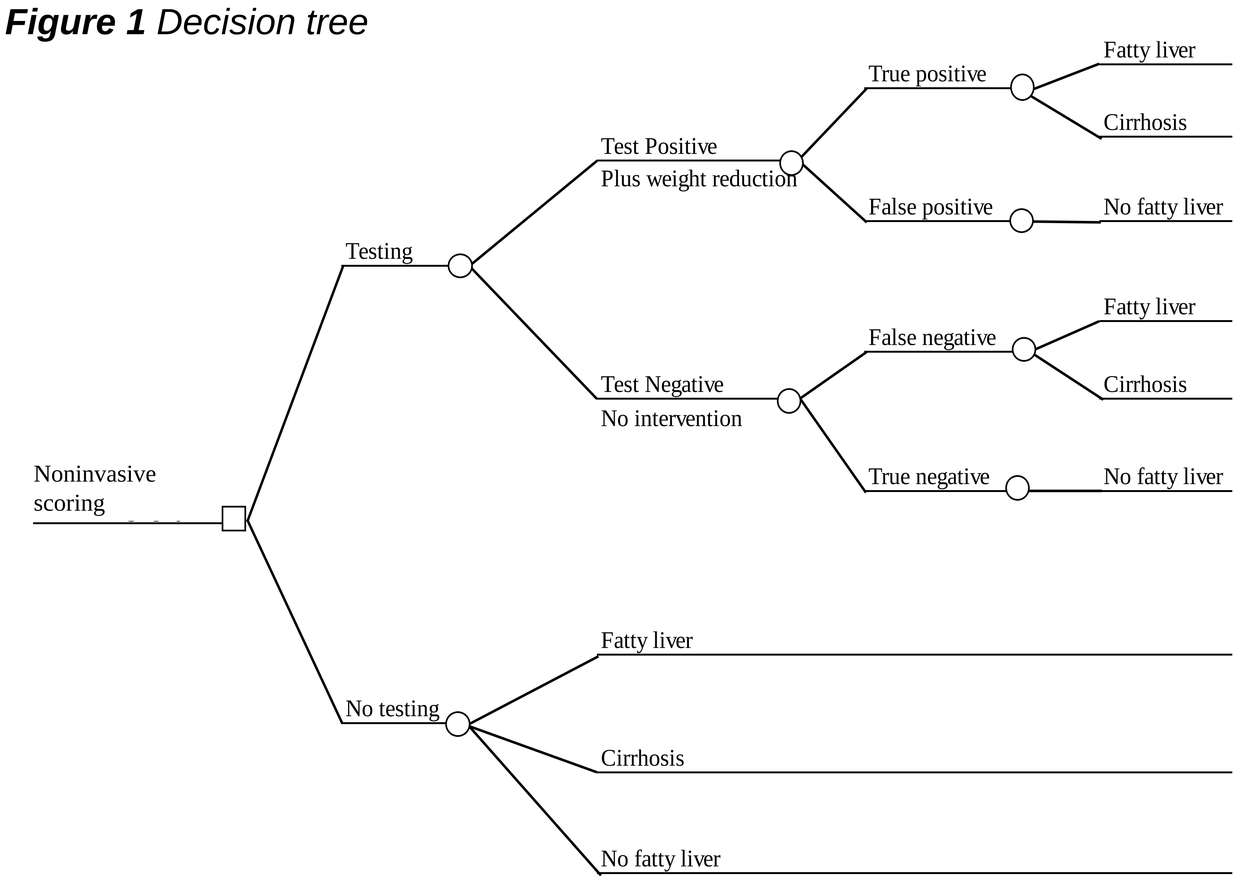
Input parameters		Mean	SE
Prevalence of NAFLD		0.678	0.160
Risk reduction of weight reduction		0.191	0.023
Hazard ratio of NAFLD		1.290	0.165
Hazard ratio of cirrhosis		3.130	0.399
NAFLD-MS	Sens.	0.698	0.070
	Spec.	0.460	0.005
FLI	Sens.	0.828	0.027
	Spec.	0.472	0.033
LAP	Sens.	0.885	0.088
	Spec.	0.404	0.040
HSI	Sens.	0.962	0.096
	Spec.	0.199	0.020
Cost (USD)	US	29	3.7
	NAFLD-MS	5	0.6
	FLI	9	1.1
	LAP	3	0.3
	HSI	5	0.6
Utility	MetS without NAFLD	0.890	0.003
	NAFLD	0.840	0.071
	Compensated cirrhosis	0.748	0.042
	Decompensated cirrhosis	0.672	0.042
	HCC	0.380	0.015

HCC, hepatocellular carcinoma; MetS, metabolic syndrome; Sens., sensitivity; Spec., specificity; US, ultrasonography

Table 2 *Result of base-case analysis*

Regimen	Cost (USD)	Effectiveness (QALYs)	Incremental cost (ΔUSD)	Incremental effectiveness (ΔQALYs)	ICER (ΔUSD/ ΔQALYs)
No screening	5,657	14.12			
NAFLD-MS score	5,966	14.21	309	0.10	3,170
FLI	5,985	14.23	19	0.02	1,095
LAP	6,000	14.24	16	0.01	1,940
HSI	6,033	14.25	32	0.01	2,748

Figure 1 *Decision tree*



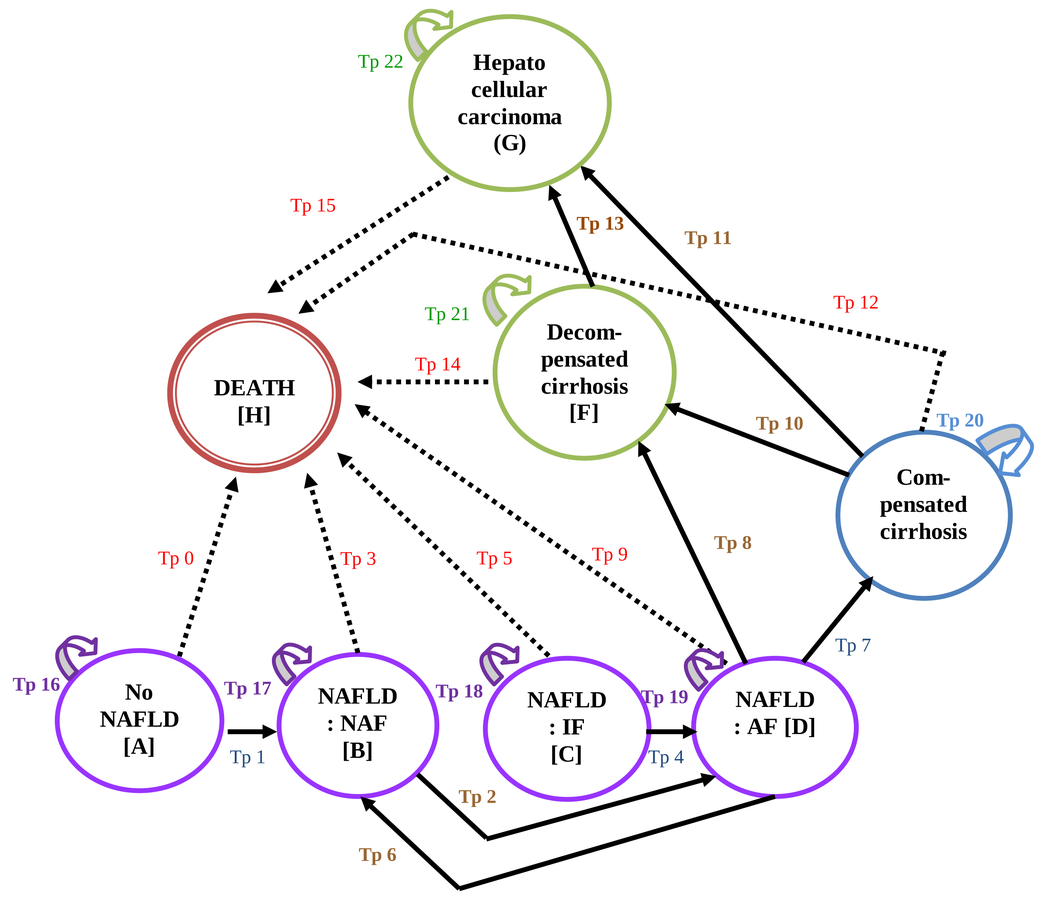


Figure 2 *Markov model represented Natural course of NAFLD*

CONCLUSIONS:

Noninvasive scores were cost-effective for screening of NAFLD among MetS patients. Patients with moderate- and high-risk of NAFLD by scoring system are recommended for ultrasonography confirmation. The patients will receive early diagnosis with good value of money and overuse of ultrasonography can be avoided. Our findings can be used as part for policy decision making in NAFLD screening program.