RWD205

Cost-Effectiveness of Concurrent Korean and Western Medicine Treatment vs. Usual Care for Car Accident-Related Whiplash Injuries in Korea: A Markov Model Decision Analysis,

NamKwen Kim[1)2)]

1. Department of Korean Medicine, Pusan National University, 2. Center for Big data and CER and Economic evaluation in Health & Medicine

INTRODUCTION

- In South Korea, many patients with car accident-related injuries are treated with a combination of Korean Medicine (KM) and Western Medicine (WM).
- Recently, total car insurance reimbursements for this concurrent treatment—particularly for whiplash injuries, which are among the most common outcomes of car accidents—have steadily increased[1)].
- However, the cost-effectiveness of such concurrent treatments for car accident-related injuries, including whiplash, has not yet been evaluated using real-world data.

OBJECTIVE

This study aims to evaluate the cost-effectiveness of concurrent treatment with Korean Medicine and Western Medicine (usual care), compared to usual care alone, for whiplash patients in South Korea.

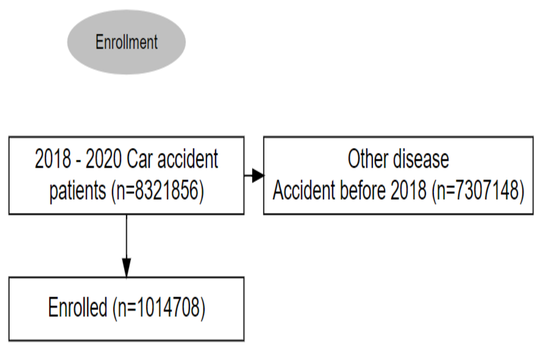
METHODS

- A Markov decision-analytic model was employed to estimate the cost-effectiveness of the two treatment alternatives.
- The model structure and cost data were derived from Korean car accident insurance data administered by HIRA (Health Insurance Review & Assessment Service).
- Utility values and comparative effectiveness parameters were obtained from analyses of the 1st stage Korean Health Panel Survey (KHPS) data.
- The Markov model used a 1-year cycle length and a 3-year time horizon.
- All statistical analyses were performed using StataMP (version 18) with a significance level of $p < 0.05$. The Markov model analyses were conducted using RStudio (version 4.2.0).
- The economic evaluation was conducted from the healthcare payer's perspective, in accordance with Korean national health insurance guidelines

RESULTS

- Prevalence of car accident injury disease(HIRA Car insurance data, Jan.1.2018-Dec.31.2020, patient cases, N=8,321,856) 2)

KCD	Disease	Frequency	Percent
S13	Dislocation, sprain, and strain of joints and ligaments in the neck area	3,232,755	38.85
S33	Dislocation, sprain and strain of joints and ligaments of the lumbar spine and pelvis	1,837,824	22.08
S06	Intracranial injury	477,013	5.73
S43	Dislocation, sprain and strain of the joints and ligaments of the shoulder girdle	426,451	5.12
S83	Dislocation, sprain and strain of joints and ligaments of the knee	181,794	2.18

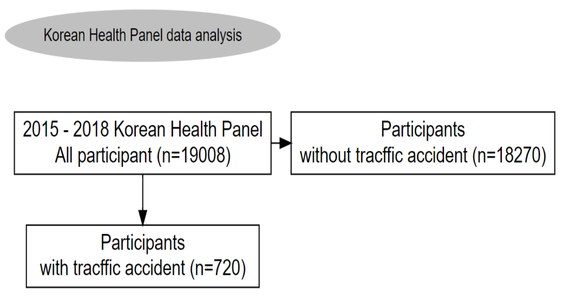


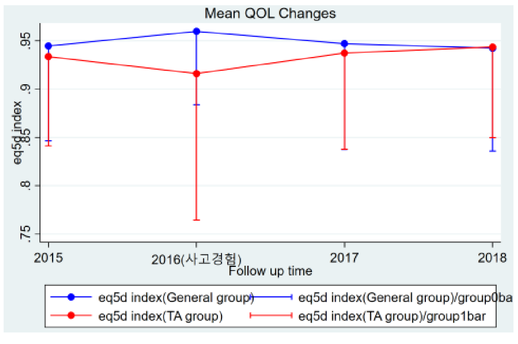
- Medical utilization process & Treatment duration(N=1,014,708)

Medical Utilization Process	Patients(N=1,014,780)	
	n	%
Medical treatment	557,881	55.35
Korean medicine treatment	246,372	24.45
Concurrent treatment	203,576	20.20

Treatment duration	Patients(N=1,014,780)	
	n	%
Under 1 year	1,007,349	99.27
1-2 years	5,641	0.56
Over 2 years	1,790	0.18

- Flow diagram and Mean QOL(EQ-5D)changes with vs without car accident (KHPS, 2015-2018, patient cases, N=19,008) 3)



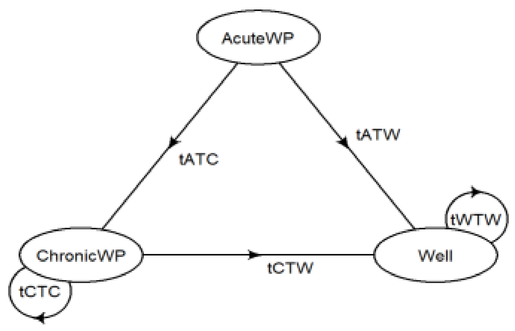


- Cox proportional hazard ratio(1 year) in concurrent treatment compared with usual care (KHPS, 2015-2018, patient cases)

v.s. Usual care		Model 1		Model 2		Model 3	
		H.R.	S.E.	H.R.	S.E.	H.R.	S.E.
Treatment	Concurrent	0.649	0.227	0.719	0.258	0.590	0.235
	Log likelihood	-200.74		-199.75		-188.06	

Model 1; Univariate, Model 2; Adjusting age, gender, marriage, Model 3; Model 2 + education, employment, Scale parameter = 365.25

- Markov model and transition matrix developing (Cohort = 50 years male patients)

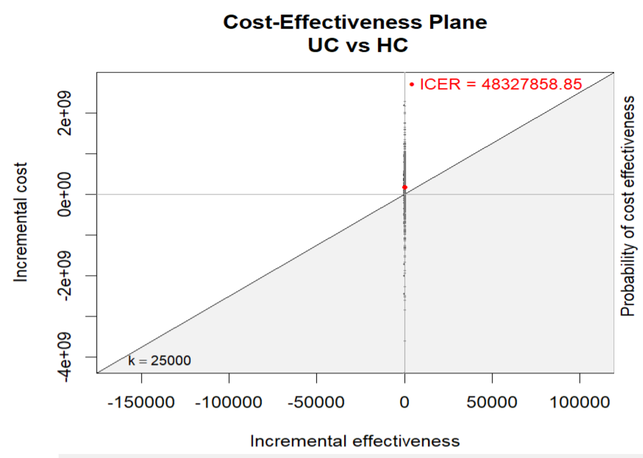


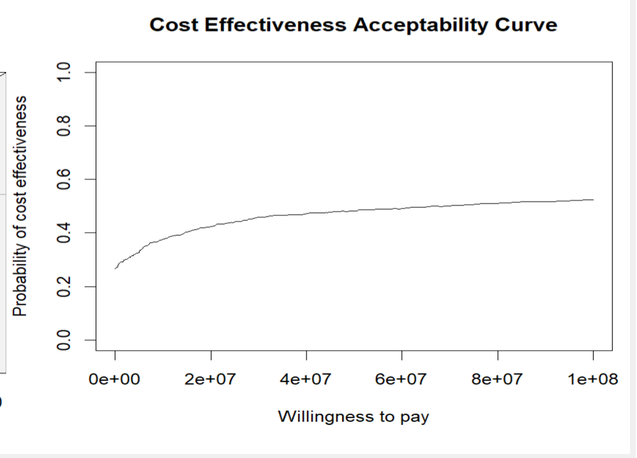
From/To	AcuteWP	ChronicWP	Well
AcuteWP	0	tATC	tATW
ChronicWP	0	tCTC	tCTW
Well	0	0	tWTW

- Incremental cost-effectiveness ratio(Deterministic, 1,000 adult cohort)

Alternatives	Cost	Incr. Cost	Effectiveness	Inc.Effect.	ICER
Usual Care	237,475,234		2,687.733		
Concurrent	397,985,745	160,510,511	2,690.709	2.976	53,934,983.53

- Probabilistic sensitivity analysis(Monte-Carlo simulation,1,000 iterate)





CONCLUSION

- The deterministic analysis showed an ICER of 53,934,984 KRW per QALY.
- Probabilistic sensitivity analysis yielded a similar ICER of 48,327,858 KRW per QALY, with a 45.9% probability of cost-effectiveness at the national health insurance threshold (30,500,000 KRW/QALY)
- Decision guideline of threshold for car insurance treatment reimbursement has not been defined in Korea
- Korean NHI guideline threshold : 30,500,000 KRW per QALY
- Nominal per capita GDP threshold: 36,024 USD(2024) = 50,923,290 KRW per QALY

LIMITATION

- Effectiveness estimation: There is no supporting evidence from RCTs, PCTs, or CER.
- Markov model structure: The model does not include a "dead" health state, which may limit its comprehensiveness.
- Perspective: The analysis adopted a limited societal perspective, excluding direct non-medical costs and productivity losses.
- Medical utilization: Medical service usage among car accident patients may vary significantly between victims and perpetrators, introducing potential selection bias and medical utilization.

REFERENCES

1. Korean Statistical Information Service (Car insurance review) : https://kosis.kr/search/search.do
2. HIRA health insurance open data system: https://opendata.hira.or.kr
3. Korea Health Panel Survey : https://www.khp.re.kr

Corresponding author : Namkwen Kim(drkim@pusan.ac.kr)