

Optimal selection of sedatives in cirrhotic patients to avoid minimal hepatic encephalopathy using Stroop test: A randomized clinical trial

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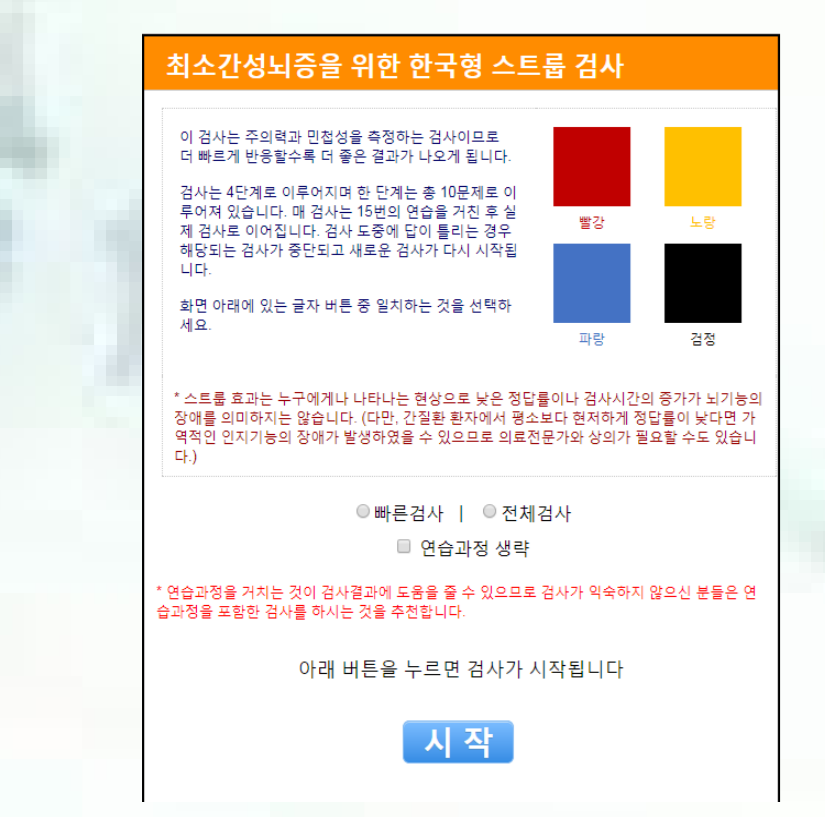
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BACKGROUND

- ✓ **Sedative Endoscopy in Cirrhotic Patients**
 - The indiscriminate use of sedative drug during endoscopy can pose a risk of minimal hepatic encephalopathy (MHE) in patient with liver cirrhosis.
 - However, it has not been studied yet which drugs are safest and most inviting on these patients.

Stroop effect & test in Korea

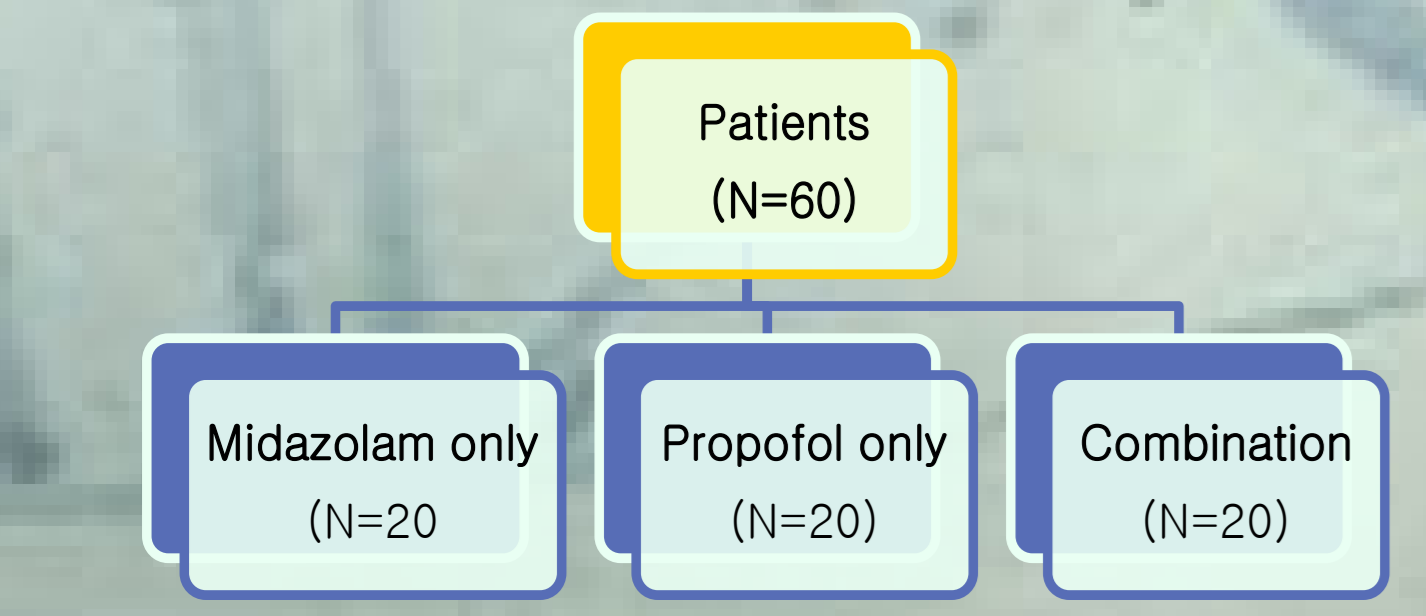


AIMS

To evaluate which one among midazolam, propofol, or combination therapy, was the least likely to cause complications including MHE by using Stroop application in cirrhotic patients.

PATIENTS AND METHODS

- ✓ **Period**
 - From January 2018~ October 2018
- ✓ **Inclusion criteria**
 - Patients diagnosed as liver cirrhosis from age 19-70
 - Patients who are going to perform gastroscopy
- ✓ **Exclusion criteria**
 - History of overt hepatic encephalopathy
 - Evidence of gastrointestinal bleeding
 - ASA Class IV or higher

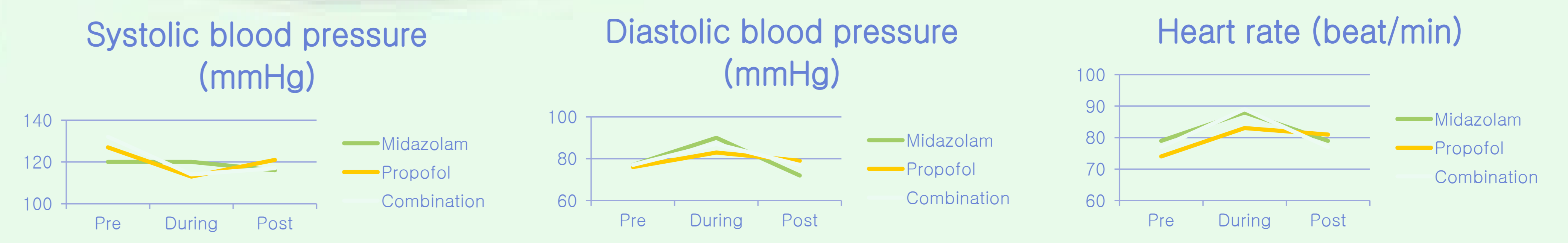


RESULTS

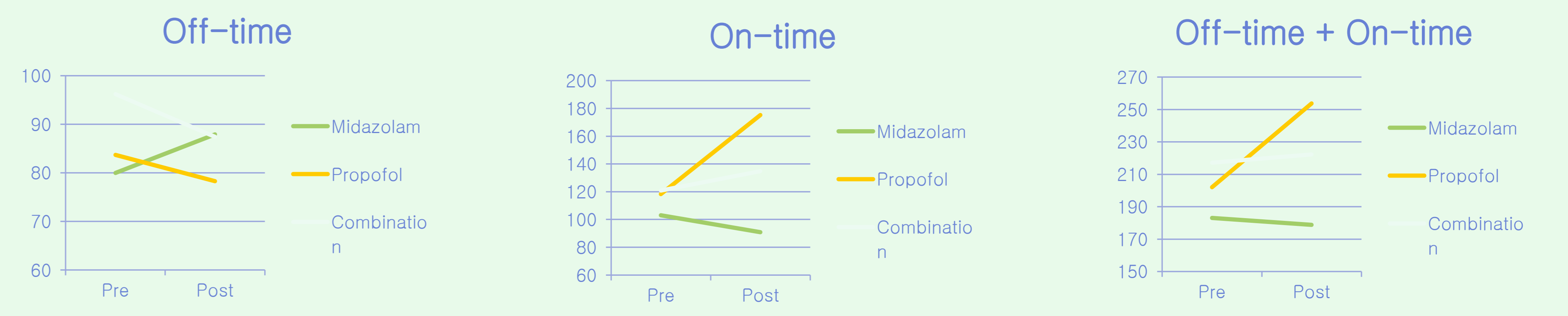
Result 1. Demographic and clinical characteristics

Characteristics	All (N=60)	Midazolam (N=20)	Propofol (N=20)	Combination (N=20)	P
Demographics					
Age (years) – mean ± SD	52.63 ± 10.07	49.75 ± 9.41	53.05 ± 11.48	55.10 ± 8.68	0.237
Sex (male) – number (percent)	48 (80)	15 (75)	17 (85)	16 (80)	0.732
ASA class – number (percent)					0.545
I-II	27 (45)	8 (40)	11 (55)	8 (40)	
III	33 (55)	12 (60)	9 (45)	12 (60)	
Education level – number (percent)					0.287
Low-educated (< 9 years)	12 (20)	6 (30)	2 (10)	4 (20)	
High-educated (≥ 9 years)	48 (80)	14 (70)	18 (90)	16 (80)	
Etiology – number (percent)					0.414
Alcohol	34 (56.7)	13 (65.0)	12 (60.0)	9 (45.0)	
Non-alcohol	26 (43.4)	7 (35.0)	8 (40.0)	11 (55.0)	
Laboratory values – mean ± SD					
White blood cell count (10 ³ /mL)	4.96 ± 2.62	4.81 ± 2.07	5.28 ± 3.17	4.81 ± 2.60	0.808
Hemoglobin (g/dL)	10.8 ± 2.2	10.8 ± 2.5	11.4 ± 1.7	9.9 ± 2.2	0.107
Platelet count (10 ³ /mL)	100.0 ± 48.6	97.9 ± 36.4	101.9 ± 64.7	100.3 ± 42.8	0.968
AST (IU/L)	60.0 ± 52.2	74.4 ± 74.6	60.1 ± 36.4	45.6 ± 34.0	0.222
ALT (IU/L)	27.9 ± 27.0	34.3 ± 37.3	27.1 ± 14.5	22.3 ± 24.3	0.379
Total bilirubin (mg/dL)	2.2 ± 2.7	2.5 ± 3.5	2.0 ± 1.9	2.2 ± 2.7	0.839
Serum albumin (g/dL)	3.2 ± 0.7	3.2 ± 0.7	3.2 ± 0.6	3.1 ± 0.6	0.929
Prothromin time (INR)	1.3 ± 0.3	1.3 ± 0.4	1.3 ± 0.2	1.2 ± 0.3	0.940
Serum creatinine (mg/dL)	0.9 ± 0.2	0.9 ± 0.2	0.9 ± 0.1	0.9 ± 0.1	0.823
Serum sodium (mmol/L)	138.5 ± 3.7	138.6 ± 3.8	138.6 ± 3.8	138.4 ± 3.7	0.990
Liver function					
Ascites – number (percent)					0.477
None	26 (43.3)	9 (45.0)	11 (55.0)	6 (30.0)	
Mild to moderate	20 (33.3)	7 (35.0)	4 (20.0)	9 (45.0)	
Severe	14 (23.3)	4 (20.0)	5 (25.0)	5 (25.0)	
MELD score – median [IQR]	9.49 [8.19-13.13]	9.36 [8.02-12.71]	10.04 [9.19-13.43]	8.92 [7.45-13.15]	0.608
Child-Pugh class – number (percent)					0.889
Class A	23 (38.4)	6 (30.0)	9 (45.0)	8 (40.0)	
Class B	29 (48.3)	11 (55.0)	9 (45.0)	9 (45.0)	
Class C	8 (13.3)	3 (15.0)	2 (10.0)	3 (15.0)	
Endoscopic findings – number (percent)					
Esophageal varices					0.464
No varix	10 (16.7)	2 (10.0)	3 (15.0)	5 (25.0)	
F1	19 (31.7)	7 (35.0)	7 (35.0)	5 (25.0)	
F2	26 (43.3)	11 (55.0)	8 (40.0)	7 (35.0)	
F3	5 (8.3)	0 (0)	2 (10.0)	3 (15.0)	
Gastric varices					0.058
No	47 (78.3)	19 (95.0)	15 (75.0)	13 (65.0)	
Present	13 (23.7)	1 (5.0)	5 (25.0)	7 (35.0)	
Sedative drug – median [IQR]					
Midazolam (mg)	2 [0-3]	3 [3-4]	0	1.5 [1-3]	0.002
Propofol (mg)	22.5 [0-45]	0	50 [40-60]	27.5 [20-40]	0.007

Result 2. Vital sign changes during sedative endoscopy



Result 3. Result of the Stroop test



Result 4. Subjective satisfaction measurement

Outcomes	All (N=60)	Midazolam (N=20)	Propofol (N=20)	Combination (N=20)	P
Time-to-recovery (minute)	14.0 (7.0–14.0)	27.0 (14.5–39.7)	8.0 (4.2–13.0)	15.0 (7.2–25.0)	0.006
Doctors (points/10)					
Overall satisfaction	8.0 (7.0–9.0)	8.0 (7.0–9.0)	7.5 (6.0–9.0)	9.0 (8.0–10.0)	0.024
Nurses (points/10)					
Overall satisfaction	8.0 (7.0–9.0)	8.0 (6.2–8.3)	7.0 (6.0–8.4)	8.5 (8.0–9.0)	0.053
Patients (points/10)					
Overall satisfaction	10.0 (8.0–10.0)	10.0 (8.0–10.0)	9.0 (8.0–10.0)	9.5 (8.3–10.0)	0.365
Recall of pain or discomfort	0 (0–2.0)	0 (0–0)	0.5 (0–4.7)	0 (0–2.0)	0.127
Awakening	1.0 (0–7.7)	0 (0–5.0)	9.5 (4.2–10.0)	0 (0–1.0)	<0.001
Memory	1.5 (0–9.7)	0 (0–4.7)	8.5 (4.2–10.0)	0 (0–4.0)	<0.001

CONCLUSIONS

In patients with cirrhosis, sedative endoscopy using midazolam, propofol, or combination therapy is relatively safe, and was not associated with increased risk of MHE. However, since there is subjective satisfaction or recovery time difference among sedative agents, it should be considered according to each individual patient.