Comparison Study of Massive Hydration With Lactated Ringer's Solution Versus Standard hydration Using Normal Saline For Preventing Post ERCP Pancreatitis In High Risk Group

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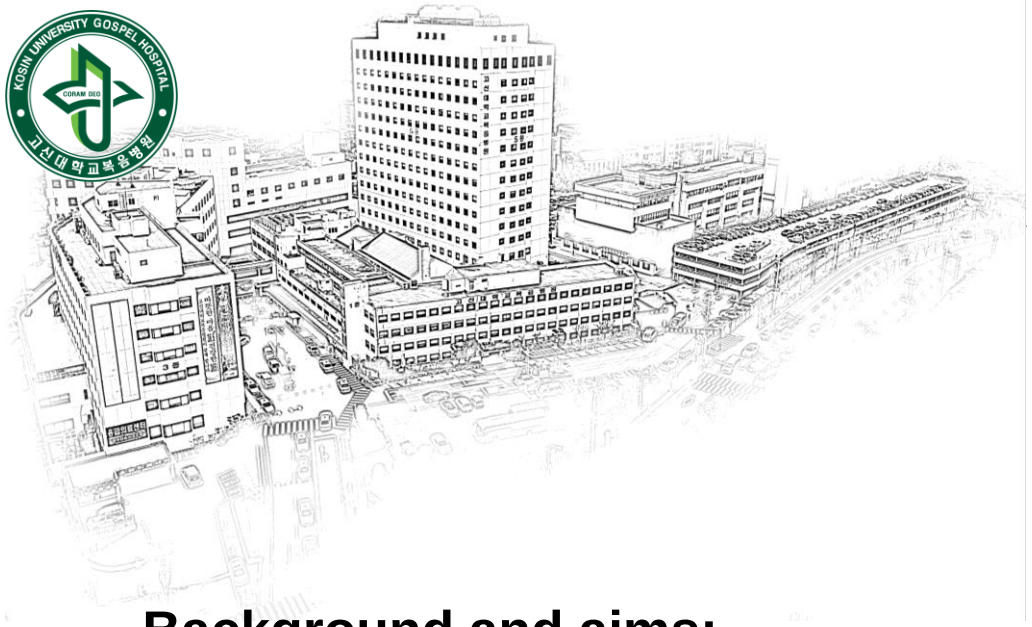
NO CONFLICT OF INTEREST



Background and aims:

Endoscopic retrograde cholangiopancreatograpy (ERCP) is essential for the diagnosis and treatment of pancreaticobiliary disorders, but the risk of post ERCP pancreatitis is high. In this study, we evaluated the efficacy of Ringer's lactated solution for the prevention of pancreatitis after ERCP

Methods:

Between Jan 2014 and Dec 2015, patients with ERCP who were admitted due to stones, sludge, tumors and benign biliary strictures were studied. 60 patients included in the study were divided into massive hydration group and standard hydration group. The fluid were Ringer's lactated solution in the massive hydration group and normal saline in the standard hydration group. When analyzing the baseline characteristics, the continuous data were the T-test or the Mann-Whitney test. The Fisher exact test was used to determine the primary outcome.

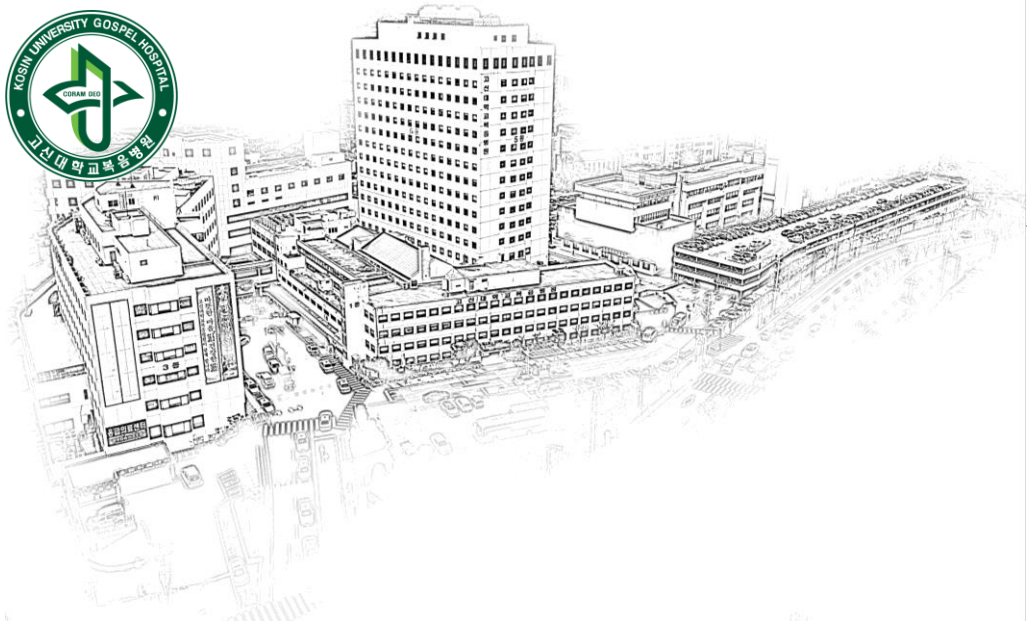


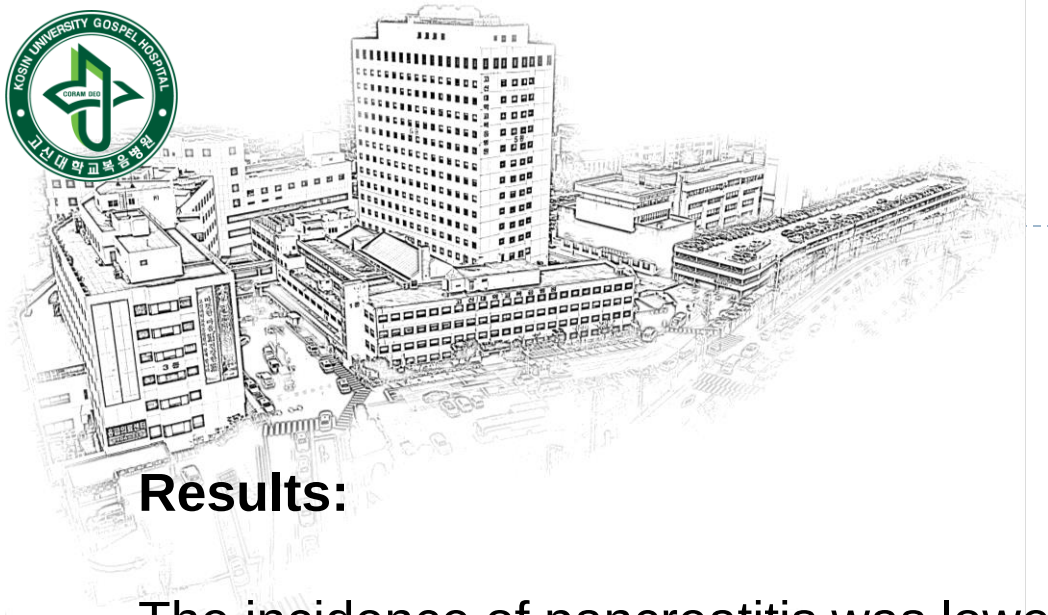
Table 1. Baseline clinical characteristics

	All patient (n=60)	Massive hydration (n=34)	*Standard hydration (n=26)*
Age, y, mean (SD)	58.5 (±13.9)	60.6 (±12.3)	55.9 (±15.8)
Female sex, n (%)	36(60)	21(61.8)	15(57.7)
Kg, mean (SD)	63.8(±13)	62.8(±10.4)	65.2(±15.9)
Hematocrit, %, mean (SD)	39.9(±4.6)	40.0(±4.9)	39.0(±4.3)
Creatinine, mg/dL, mean (SD)	0.9(±0.4)	0.9(±0.4)	0.8(±0.3)
Primary inducation, n (%)			
Bile duct stone	45(75)	24(70.6)	21(80.8)
Malignancies	10(16.6)	6(17.6)	4(15.4)
Other	5(8.3)	4(11.8)	1(3.8)

NOTE.P value for comparison were not significant
SD,standard deviation

Results:

Patients in both groups showed different age groups, gender, and body weights, but early precut procedures were common in that they were at high risk for post-ERCP pancreatitis (Table 1). In both groups, the indications for the procedure were mostly CBD stones.



Results:

The incidence of pancreatitis was lower in patients who underwent prophylactic fluid therapy. So hyperamylasemia or hyperlipasemia was also considered to be a significant result. Amylase and lipase elevation was observed when the pancreatic enzyme was elevated more than 3 times. the upper normal limit (amylase> 330 U / L or lipase> 150 U / L) at 4 hours after the procedure and lasted more than 24 hours after the procedure. And The patient's pain was assessed as visual analogue pain scale 3 or more, which lasted more than 24 hours after the procedure. The amount of fluid administered to the two groups during the first 8 hours after the procedure was 4148 ± 918 mL in the massive hydration group and 756 ± 183 mL in the standard hydration group.

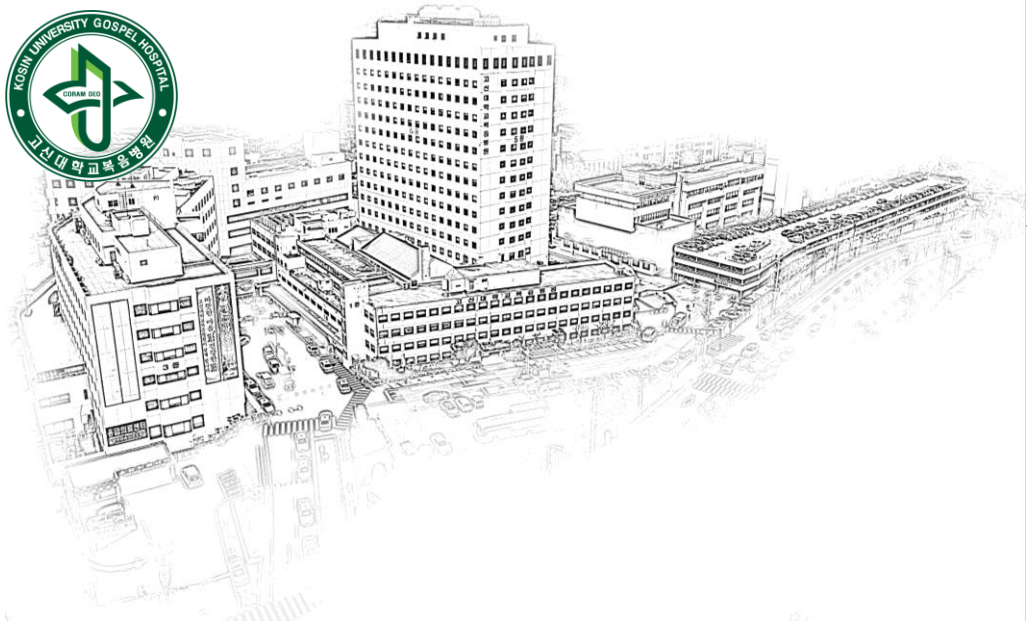


Table 2. Result of hydration group

	Massive hydration (n=34)	*Standard hydration (n=26)*	P-value
Post ERCP pancreatitis, n(%)	0 (0)	4 (15.4)	0.031
Hyperamylasemia or hyperlipasemia, n(%)	2 (5.9)	7 (26.9)	0.032
	Median(IQR)	**Median(IQR)**	**P-value**
Total fluid during first 8hours(mL)	4148(918)	756(183)	<0.001

Results:

Post ERCP pancreatitis was significantly lower in the massive hydration group than in the standard hydration group (0%, 0 of 34 vs 15.4%, 4 of 26) (P = 0.031) (Table 2). Two of 34 cases (5.9%) in the massive hydration group and 7 out of 26 (26.9%) in the standard hydration group had elevated pancreatic enzyme levels (amylase> 330 U / L or lipase> 150 U /) (P = 0.032)

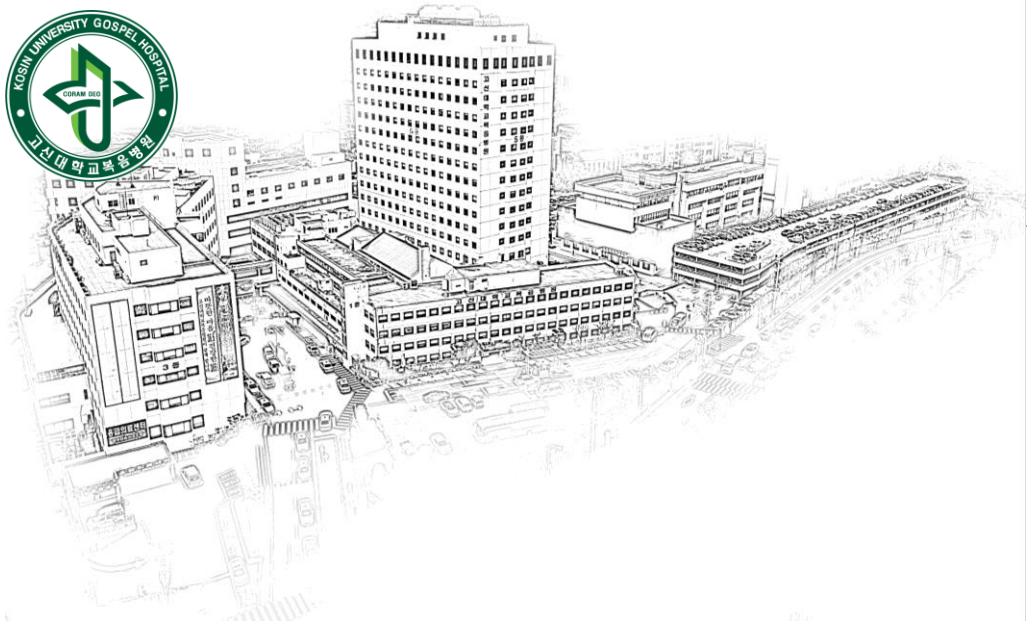
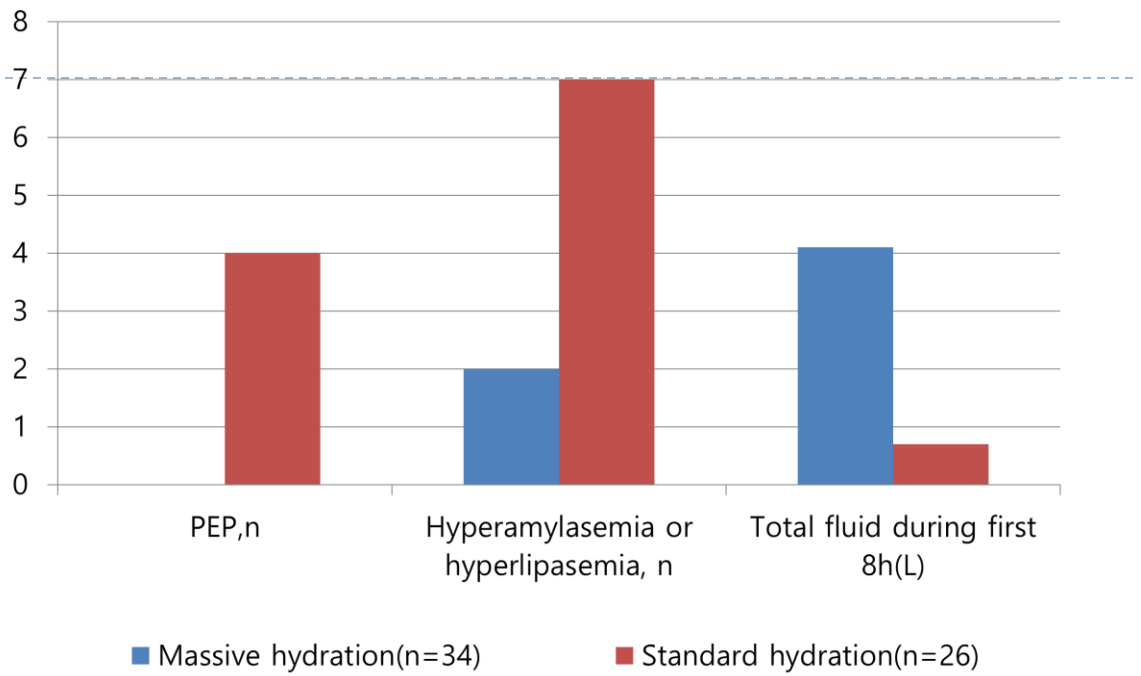
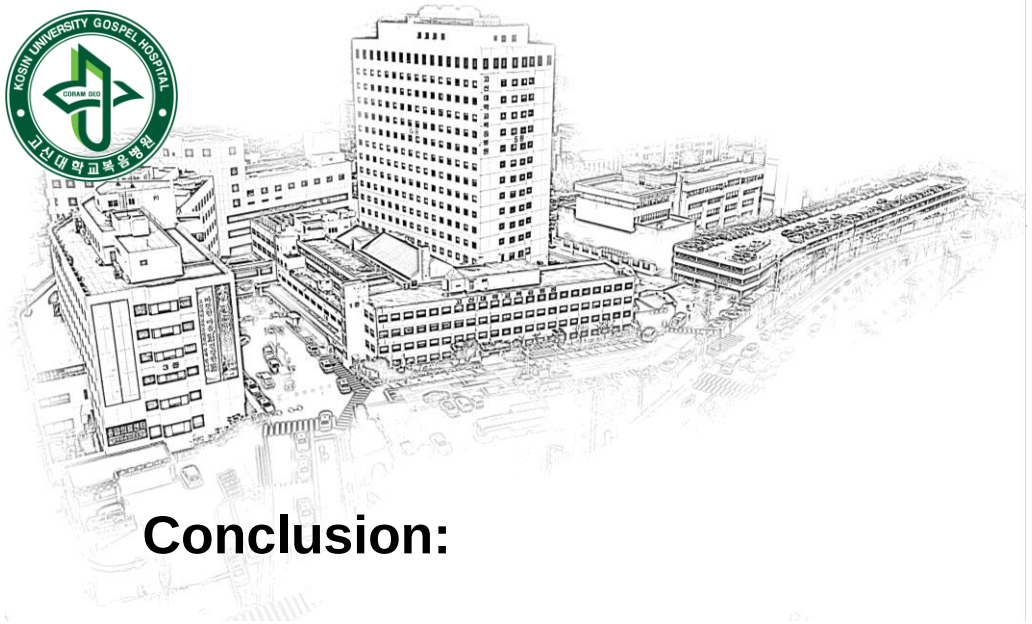


Fig.1 Result of hydration strategy



Results:

The main cause of pancreatic necrosis after ERCP is a decrease of the microvascular circulation of pancreas. Sufficient fluid therapy is essential to prevent this. There is no difference according to the type of solution when administering low dose of fluid, but lactated Ringer's solution is more suitable because it is less likely to cause metabolic acidosis than normal saline when used at more than 200mL per hour.



Conclusion:

In previous studies, 3 mL / kg / h was administered intravenously for 8 hours during and after the procedure. However, in this study, the amount of fluid was increased by the administration of 6 mL / kg / h to improve the microperfusion effect of the pancreas . In this study, the incidence of post-ERCP pancreatitis was significantly lower than that of standard hydration when massive hydration was performed. In addition, hyperamylasemia or hyperlipasemia with no abdominal pain lasting 24 hours after the procedure was less observed in the massive hydration group. As a result, periprocedural massive hydration with lactated Ringer's solution was effective for the prevention of post ERCP pancreatitis.