Efficacy of rasburicase in children with acute kidney injury (AKI) from diarrhea associated hemolytic uremic syndrome (HUS)

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BACKGROUND

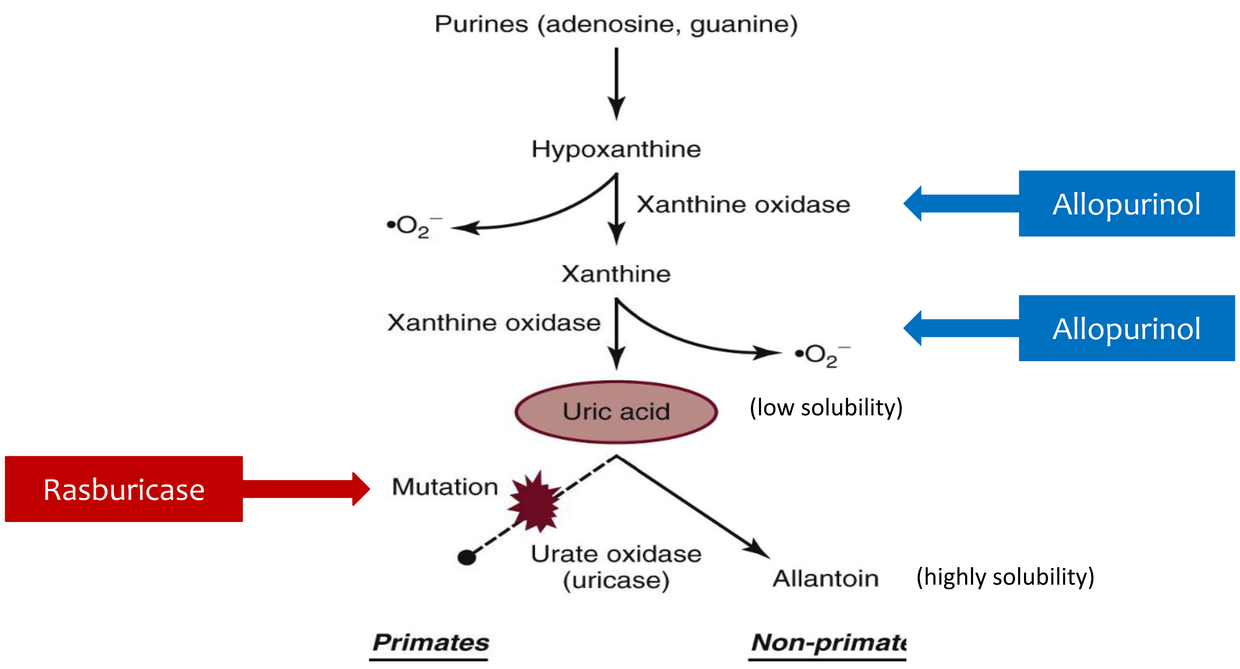
■ **Hyperuricemia** due to AKI and hemolysis in diarrhea associated HUS

- worsening AKI that is caused by high levels of uric acid in the urine
- no specific treatment

■ **Acute urate nephropathy**

- mechanical obstruction: deposition of uric acid crystals within the kidney interstitium and tubules
- direct toxicity: antiangiogenic properties, pro-oxidative properties
- local and systemic inflammation: proinflammatory properties

■ **Management of hyperuricemia**



■ This study was to evaluate the effect of rasburicase on AKI from diarrhea associated HUS.

METHODS

■ **Retrospective cohort study**

- January 2001 - July 2017
- Pediatric patients with diarrhea associated HUS (n=72)

■ **Diarrhea associated HUS**

- Microangiopathic hemolytic anemia, thrombocytopenia, AKI
- Preceding diarrhea or enterohemorrhagic *E. coli* PCR (+)

■ **Clinical outcomes**

- Rasburicase group vs. Control group
- During hospitalization: need for dialysis, duration of hyperuricemia, length of hospital stay
- At 1 year follow-up: serum creatinine, eGFR, proteinuria

RESULTS

Figure 1. Prevalence of rasburicase use

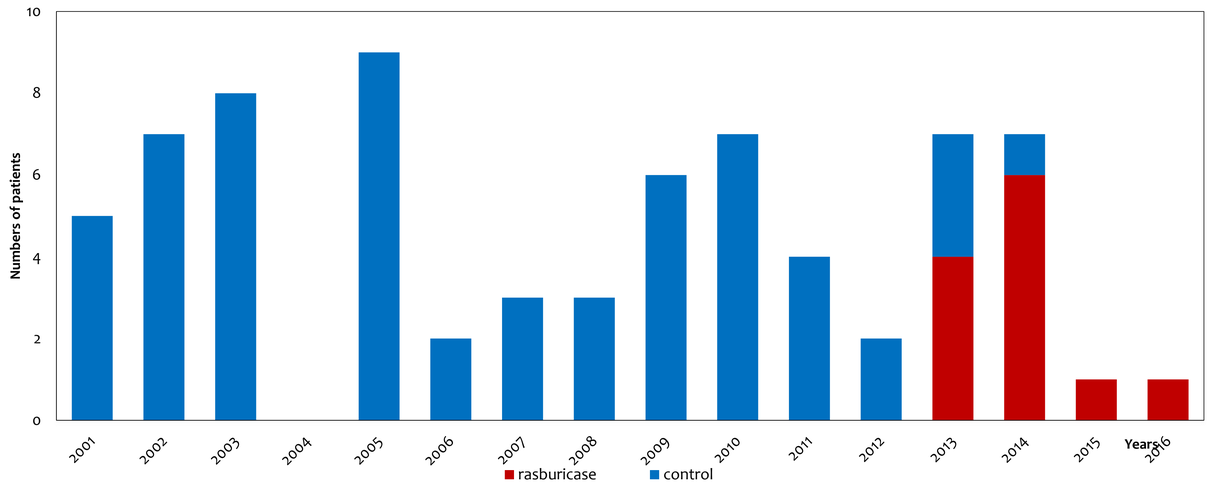


Table 1. Baseline Characteristics

	Rasburicase group (n=12)	Control group (n=60)	*P* value
Male	8 (66.7)	28 (46.7)	0.225
Age, years	4.2 (2.5-5.4)	3.1 (1.8-4.6)	0.155
WBC (/mm³)	15,600 (12,000-25,700)	14,650 (10,860-19,820)	0.369
Hemoglobin (g/dL)	6.2 (5.8-7.3)	6.3 (5.7-6.8)	0.550
Platelet (/uL)	**14,000 (12,000-18,000)**	**25,000 (20,000-38,000)**	**0.002**
Uric acid (mg/dL)	12.1 (9.5-13.1)	12.8 (10.2-15.2)	0.322
BUN (mg/dL)	91 (59-105)	91 (63-115)	0.586
Creatinine (mg/dL)	3.39 (1.58-5.30)	4.10 (2.06-6.18)	0.436
eGFR (mL/min/1.73m²)	12.3 (8.3-26.3)	9.5 (6.8-18.3)	0.270

Values were expressed as numbers (%) and median (range).

Table 2. Outcomes during hospitalization

	Rasburicase group (n=12)	Control group (n=60)	*P* value
Need for dialysis	8 (66.7)	33 (55.0)	0.456
Duration of dialysis*, days	4 (1-7)	6 (3-13)	0.262
Length of hospital stay, days	**11 (10-15)**	**14 (12-21)**	**0.043**
Mortality	0	0	1.000

Values were expressed as numbers (%) and median (range).
*Patients who were included.

Figure 2. Duration of hyperuricemia

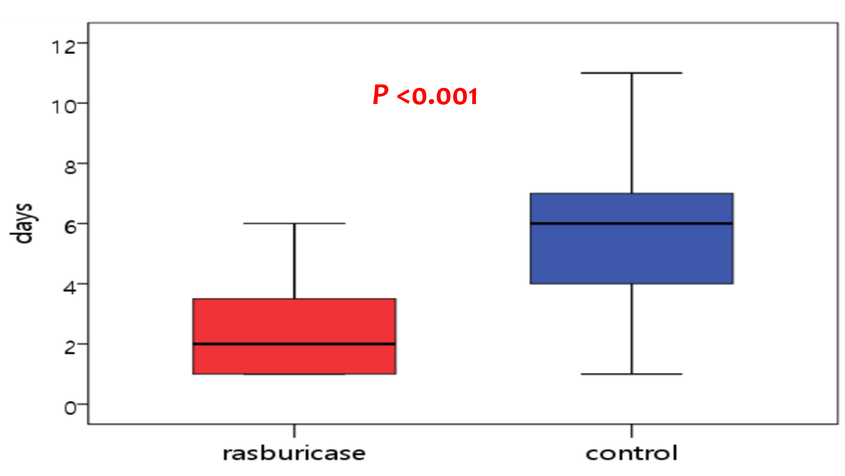
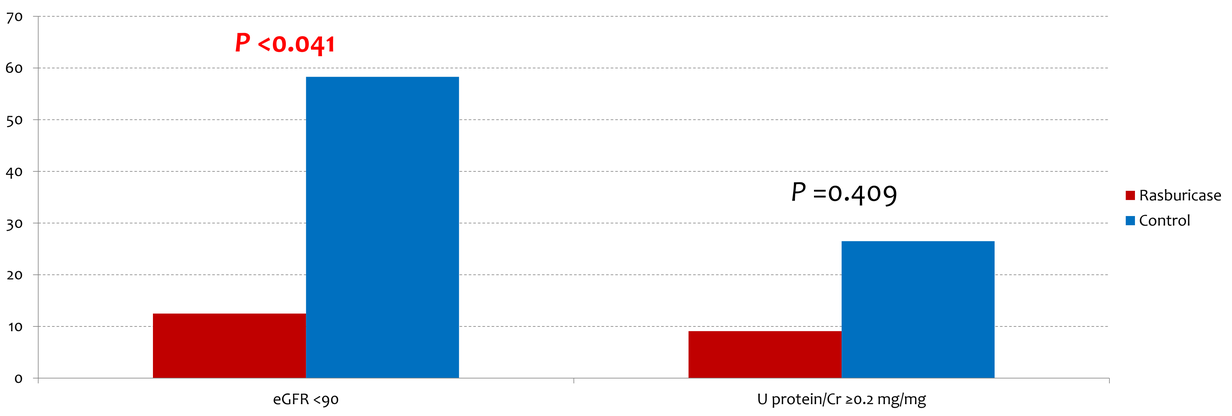


Table 3. Outcomes at 1 year follow-up

	Rasburicase group (n=11)	Control group (n=36)	*P* value
Creatinine (mg/dL)	**0.41 (0.37-0.49)***	**0.55 (0.40-0.60)****	**0.031**
eGFR (mL/min/1.73m²)	**111.0 (105.3-126.7)***	**78.8 (63.7-103.6)****	**0.003**
ESRD, n (%)	0	0	-

*n=8, **n=30

Figure 3. eGFR and proteinuria at 1 year follow-up



CONCLUSION

■ Although rasburicase treatment in patients with diarrhea associated HUS **did not lower the requirement of dialysis**, patients who were treated with rasburicase during the acute phase were **discharged earlier from the hospital and had better renal function at 1 year follow-up**.

■ Since there are no known effective therapies for AKI induced by diarrhea associated HUS, we may consider rasburicase to improve their long-term renal outcome.