

Supplementary Online Content

Lehtiranta S, Honkila M, Kallio M, et al. Risk of electrolyte disorders in acutely ill children receiving commercially available plasmalike isotonic fluids: a randomized clinical trial. *JAMA Pediatr*. Published online October 26, 2020. doi:10.1001/jamapediatrics.2020.3383

eTable. Full List of Randomized Clinical Trials Comparing Isotonic Fluid Therapy and Hypotonic or Moderately Hypotonic Fluid Therapy in Children

eReferences

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable. Full List of Randomized Clinical Trials Comparing Isotonic Fluid Therapy and Hypotonic or Moderately Hypotonic Fluid Therapy in Children

Publication Reference list below	Year	Country	Patient population	Samp le size	Fluid therapy	P-Na <135	P-Na <130	P-Na >148	P-K <3.5	P-K <3.0	Need for additional electrolytes	Weight change	Main result and conclusions
Álvarez <i>et al.</i> ¹	2008	Spain	PICU Mixed 84% surgical 29 d – 18 y	122	Na 140 mmol/l vs. Na 20- 100mmol/l	3/59 13/63	0/59 3/63	1/59 1/63	n/a	n/a	n/a	n/a	Hypotonic maintenance fluid increased the risk of hyponatremia at 24h.
Yung <i>et al.</i> ²	2009	Australia	PICU Mixed 74% surgical 29 d – 18 y	50	Na 154 mmol/l vs. Na 30 mmol/l Normal vs restricted rate	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Dextrose saline (NaCl 30 mmol/L) led to a mean fall of 3 mmol/l in P-Na.
Rey <i>et al.</i> ³	2011	Spain	PICU Mixed 46% surgical	125	Na 136 mmol/l vs. Na 30-50 mmol/l (+K 20 mmol/l)	7/45 16/39	1/45 3/39	1/63 0/62	n/a	n/a	n/a	n/a	Hypotonic maintenance fluids increased the incidence of hyponatremia in critically ill patients.
Jorro Barón <i>et al.</i> ⁴	2013	Argentina	PICU Mixed 11% surgical 1 m – 18 y	66	Na 154 mmol/l vs. Na 77 mmol/l (+ K 0-20 mmol/l)	4/31 5/32	0/31 1/32	(>145) 1/31 2/32	n/a	n/a	n/a	n/a	Risk for hyponatremia was not increased in either group.
Raksha <i>et al.</i> ⁵	2017	India	PICU Medical 1 m – 18 y	240	Na 154 mmol/l normal rate vs. Na 23 mmol/l restricted rate (+ K 20 mmol/l)	10/120 20/120	2/120 3/120	(>145) 3/120 0/120	n/a	n/a	Hyponatremia was treated with 3% saline	n/a	Treatment with restricted (2/3) hypotonic maintenance fluid increased incidence of hyponatremia.
Brazel <i>et al.</i> ⁶	1996	Australia	Postoperative (Scoliosis) 12.3 – 18.1 y Female pts	12	Na 131 mmol/l (Hartmann's) vs. Na 30-50 mmol/l	1/5 7/7	0/5 4/7	0/5 0/7	n/a	n/a	n/a	n/a	Isotonic saline treatment protected patients from SIADH when undergoing surgery for scoliosis.

Neville <i>et al.</i> ⁷	2010	Australia	Postoperative 6 m – 15 y	124	Na 154 mmol/l vs. Na 77 mmol/l	6/62 19/62	n/a	0/62 0/62	n/a	n/a	16/124	n/a	Electrolyte content was more important than the rate of infusion in preventing hyponatremia in postoperative patients.
Choong <i>et al.</i> ⁸	2011	Canada	Postoperative 6 m – 16 y	258	Na 154 mmol/l vs. Na 77 mmol/l (+ K 0-20 mmol/l)	29/128 53/130	1/128 8/130	(>145) 4/128 5/130	n/a	n/a	Change to open label PMS 7/128 17/130	n/a	Hypotonic solutions increased the risk of postoperative hyponatremia in children. NNT with isotonic solution 6.
Coulthard <i>et al.</i> ⁹	2012	Australia	Postoperative (spinal instrumentation or craniotomy)	82	Na 131mmol/l normal rate vs. Na 77 mmol/l restricted rate (+KCl 5mmol/l)	0/39 7/40	0/39 0/40	(>145) 0/39 0/40	n/a	n/a	n/a 43-46% received fluid boluses	n/a	The plasma sodium level fell less when Na 131mmol/l was administered in comparison to 77 mmol/l.
McNab <i>et al.</i> ¹⁰	2015	Australia	Mixed 3mo – 18y 46% surgical	679	Na 140 mmol/l (Plasmalyte) vs Na 77mmol/l	12/319 35/322	2/319 5/322	(>145) 14/319 18/322	n/a	n/a	Additional potassium 13% vs 11%	n/a	Plasmalyte (Na 140 mmol/l) reduced the incidence of hyponatremia
Saba <i>et al.</i> ¹¹	2011	Canada	Mixed 3mo – 18y 57% surgical	59	Na 154mmol/l vs Na 77mmol/l	1/16 1/21	None	(>146) 1/16 0/21	n/a	n/a	n/a	n/a	77mmol/l NaCl did not result in a drop of serum sodium concentration within 12 hours of fluid therapy
Serrate <i>et al.</i> ¹²	2019	Argentina	General pediatric patients 29 days -15 y 27% surgical	299	Na 150 mmol/l vs. Na 77mmol/l	29/151 12/143	0/151 5/143	(>150) None	n/a	n/a	n/a	n/a	The incidence of hyponatremia was greater in hypotonic group
Friedman <i>et al.</i> ¹³	2015	Canada	General pediatric patients 1mo – 18 y	110	Na 154mmol/l vs. Na 77mmol/l (K 0-40mmol/l by the decision of responsible physician)	0/54 2/56	None	1/54 1/56	n/a	n/a	n/a	0.9kg vs. 0.2kg	No difference in mean sodium at 24 or 48 between the groups was observed.

Kumar <i>et al.</i> ¹⁴	2019	India	General pediatric patients 3mo-5y	168	Na 154mmol/l vs. Na 77mmol/l	5/84 12/84	2/84 2/84	(>145) 3/84 4/84	n/a	n/a	n/a	n/a	0.45% NaCl did not result in a significantly increased risk of hyponatremia
Bagri <i>et al.</i> ¹⁵	2019	India	General pediatric patients 1mo-18y	150	Na 154mmol/l vs Na 77mmol/l (+KCl 20mmol/l)	n/a	5/75 6/75	(>150) 3/75 1/75			n/a	n/a	There was a low but comparable incidence of hypo- and hypernatremia in first 12 h of hospitalization in both groups
Golshekan <i>et al.</i> ¹⁶	2016	Iran	Pediatric gastro-enteritis 6mo-14y	75	Na 154mmol/l vs Na 77mmol/l Both groups: -20ml/kg NaCl bolus -KCl 20mmol/l	4/38 5/37	n/a	n/a		non e	n/a	n/a	Isotonic fluid increased plasma sodium concentration
Ramanathan <i>et al.</i> ¹⁷	2016	India	Patients with severe pneumonia 2mo-5y	119	Na 154mmol/l vs Na 30mmol/l (+KCl 20mmol/l)	9/59 29/60	1/59 5/60	(>150) None			n/a	n/a	Isotonic maintenance fluid reduced the risk for hyponatremia
Pemde <i>et al.</i> ¹⁸	2015	India	Patients with suspected CNS infection 3mo – 5y	92	Na 154 mmol/l vs. Na 77 mmol/l vs. Na 30 mmol/l (+KCl 20mmol/l)	2/31 12/30 17/31	1/31 6/61	(>150) 1/31 0/30 0/31			n/a	n/a	Isotonic NaCl 0.9% as a intravenous maintenance fluid in children with CNS infection led to a decreased risk of hyponatremia.

Shamin <i>et al.</i> ¹⁹	2014	India	General pediatric patients 0.5 – 12 y	60	Na 154 mmol/l at 60% maintenance rate vs. Na 30mmol/l at standard maintenance rate (+KCl 10mmol/l)	n/a	10/30 21/30	(>150) 3/30 0/30		none	n/a	Weight loss in 0.9 % NaCl group (2.6%), weight gain in NaCl 0.18 % group (2.8%)	Reduced volume isotonic fluid resulted in fewer episodes of hyponatremia
Kannan <i>et al.</i> ²⁰	2010	India	General pediatric patients 3mo – 12y	167	Na 154 mmol/l at standard maintenance rate vs. Na 30mmol/l at standard maintenance rate vs. Na 30mmol/l at 2/3standard maintenance rate (+KCl 20mmol/l)	5/58 13/56 5/53	1/58 8/56 2/53	(>150) 2/58 2/56 4/53	n/a	n/a		n/a	A significant decrease in the occurrence of hyponatremia was observed with the use isotonic maintenance fluid.
Allen <i>et al.</i> ²¹	2016	US and Canada	Patients with acute gastroenteritis 6mo-11y	100	Na 140mmol/l (Plasmalyte-A) vs. Na 154 mmol/l	1/51 1/49	None	None	3.0-3.5 depending on age 2/51 6/49		n/a	n/a	Plasmalyte led to a more rapid improvement in serum bicarbonate and dehydration score.
Neville <i>et al.</i> ²²	2006	Australia	Patients with gastroenteritis 6mo-14y	102	Na 154 mmol/l vs. Na 77 mmol/l			None	n/a	n/a	n/a		Isotonic fluid may have prevented hyponatremia.

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