

Clinical Management Summary

EDcare : Handbook for Emergency Practice

Available from the Amazon Kindle Bookstore

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Clinical Management Summary Adult Diabetic Ketoacidosis & Hyperglycaemia

Hyperglycaemia

Thirst Polyuria/Polydipsia Normal GCS

Diagnosis Elevated BGL > 11 mmol/l Bedside Ketones < 0.6 mmol/l

Ketosis + Hyperglycaemia

Vomiting +/- Abdominal Pain Dehydration Normal GCS

Diagnosis

Elevated BGL > 11 mmol/l Bedside Ketones 0.6 - 3 mmol/l

Diabetic Ketoacidosis

Vomiting + Severe Dehydration Altered Confusion / Coma Sighing Respirations

Diagnosis

Elevated BGL > 11 mmol/l Bedside Ketones > 3 mmol/l $pH \le 7.30 + HCO3 \le 15 mmol/l$

Notify Retrieval Service Endocrine Service / ICU

Continued Monitoring

- Cardiac + Vital signs + GCS
- Hourly BGL, Ketones
- 2 hourly : iSTAT + VBG
- Strict fluid input/output

Management

- Assess hydration : Oral fluid rehydration for most cases
- SC Short acting Insulin : Actrapid HM or Humulin R
- Insulin dose varies but usually 4 8 U SC
- Monitor BGL and Ketones hourly for 2 4 hours
- Search for cause : Rule out infection
- Discharge when BGL decreasing + tolerating a meal

Management

- IV Fluid Rehydration : 2000 ml over 3 4 hours
- SC Short acting Insulin : Actrapid HM or Humulin R
- Insulin dose varies but usually 4 8 U SC
- Monitor BGL and Ketones hourly for 4 8 hours
- Search for cause : Rule out infection
- Discharge when BGL < 11 mmol/l + Ketones < 0.4 mmol/l + Tolerating food / fluids

Primary Survey

- A + B : Assess airway, Supplemental O₂ (aim for Sat 94 96%)
- C : Monitoring, IV Access, Fluid Resus if hypotensive / shock
- D + E : Assess AVPU, Pupils, BGL/Ketones, Temperature

Management

- Give 1000ml 0.9% Normal Saline (or Hartmanns) over 60 mins then 1000ml over next 2 hrs and 1000ml over next 4 hrs
- Insert IDC + Fluid balance Chart

AFTER administering first bag of 1000ml IV Fluid commence

- KCL : Give 10 20 mmol KCL per hour (if K+ < 5.5 mmol/l). Monitor K+ closely. ECG Monitor if KCL > 10 mmol/hr
- Insulin infusion (0.1U/kg/hr) : Use infusion chart : Add 50U Actrapid or Humulin R to 49.5 ml of 0.9%NS : 1 U/ml solution
- Administer Long acting SC insulin eg Lantus : Give patient's normal dose or 10U long-acting insulin

ONCE BGL falls < 15 mmol/l

- Change IV fluids to 5% glucose + 0.45%NS. Two bag method may be used and results in a quicker resolution of acidosis*
- Continue close monitoring and replacement of KCL

Identify Cause. DVT Prophylaxis : Enoxaparin 40mg SC daily

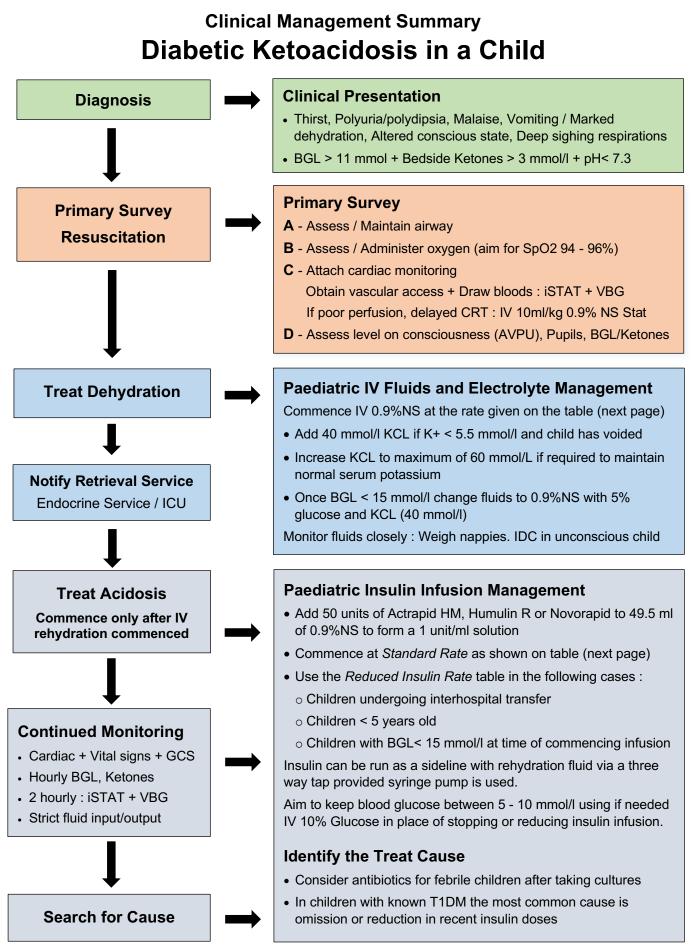
References :

Karslioglu et al. Diabetic ketoacidosis and hyperosmolar hyperglycemic syndrome: review of acute decompensated diabetes in adult patients. BMJ 2019;365:11114
Tran, Pease, Wood, Zajac et al. Review of the Evidence for Adult DKA Management Protocols : Frontiers in Endocrinology, June 2017, Volume 8. Article 106

3. Melbourne Royal Children's Hospital (Statewide) Guideline for Diabetic Ketoacidosis

*Two Bag Method : This method consists of two bags of 0.45% sodium chloride, one with and one without 10% dextrose, that are adjusted on the basis of hourly blood glucose monitoring to maintain an intravenous fluid rate of 250 mL/h.

^{4.} Regional Local Health Networks Protocol (Clinical) : Diabetic Ketoacidosis Management in Adults with Type 1 Diabetes Mellitus, Dec 2019



References :

^{1.} Karslioglu et al. Diabetic ketoacidosis and hyperosmolar hyperglycemic syndrome: review of acute decompensated diabetes in adult patients, BMJ 2019;365:11114

^{2.} Tran, Pease, Wood, Zajac et al. Review of the Evidence for Adult DKA Management Protocols : Frontiers in Endocrinology, June 2017, Volume 8. Article 106

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Paediatric Diabetic Ketoacidosis

Table showing IV Fluids and Insulin Infusion Rates by Weight

Intravenous Rehydration Recommended IV rate for starting rehydration					Insulin Infusion Commencing Infusion Rate	
Weight (kg)	Mild / Nil Dehydration mL/hour	Moderate Dehydration mL/hour	Severe Dehydration mL/hour		Standard 0.1unit/kg/hr	Reduced rate 0.05 unit/kg/hr
5	24	27	31		0.5	0.25
7	33	38	43		0.7	0.35
8	38	43	50		0.8	0.4
10	48	54	62		1	0.5
12	53	60	70		1.2	0.6
14	60	65	80		1.4	0.7
16	65	75	85		1.6	0.8
18	70	80	95		1.8	0.9
20	75	85	105		2	1
22	80	90	110		2.2	1.1
24	80	95	115		2.4	1.2
26	85	100	120		2.6	1.3
28	85	105	125		2.8	1.4
30	90	110	135		3	1.5
32	90	110	140		3.2	1.6
34	95	115	145		3.4	1.7
36	100	120	150		3.6	1.8
38	100	125	155		3.8	1.9
40	105	130	160		4	2
42	105	135	170		4.2	2.1
44	110	135	175		4.4	2.2
46	115	140	180		4.6	2.3
48	115	145	185		4.8	2.4
50	120	150	190		5	2.5
52	120	155	195		5.2	2.6
54	125	160	205		5.4	2.7
56	125	160	210		5.6	2.8
58	130	165	215		5.8	2.9
60	133	171	220		6	3
62	136	175	226		6.2	3.1
64	139	179	232		6.4	3.2
66	140	185	240		6.6	3.3
68	145	185	245		6.8	3.4
70	150	190	250		7	3.5

References :

1. Karslioglu et al. Diabetic ketoacidosis and hyperosmolar hyperglycemic syndrome: review of acute decompensated diabetes in adult patients. BMJ 2019;365:11114

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