



Hyperlactataemia is a common complication of antiretroviral therapy in children in Mopani District



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Introduction (1)

- Hyperlactataemia = elevated blood lactate
- Well-recognised side-effect in adults taking ART
- Clinical spectrum from serious lactate acidosis to asymptomatic hyperlactataemia
- All ARVs may cause hyperlactataemia, but especially NRTIs (D4T, DDI in particular)

Introduction (2)

- In Mopani District: most children on D4T in nurse-managed programme
- Symptoms and manifestations of hyper-lactataemia may be different in children
- Epidemiology of lactate levels in blood of African children on ART unknown

Definitions

Lactate level	Severity
≤ 2.0 mmol/l	Normal
2.1 – 3.5 mmol/l	Mild hyperlactataemia
3.5 – 5 mmol/l	Moderate hyperlactataemia
≥ 5 mmol/l	Severe hyperlactataemia



- Asymptomatic hyperlactataemia:
 - Elevated blood lactate level (>2.0 mmol/l), but no abnormalities in history, physical examination or bloodtests that could be related to elevated blood lactate.
- Symptomatic hyperlactataemia:
 - Elevated blood lactate level (>2.0 mmol/l) and the presence of at least one of the following symptoms: diarrhoea, vomiting, fatigue, weight loss, abdominal pain, reduced appetite, dyspnea with no other cause, peripheral neuropathy.

Objectives

- To determine the prevalence, risk factors and manifestations of hyperlactataemia in children on ART in rural South Africa

Methods (1)

- Cross-sectional study of 253 children at 7 C/PHC facilities and 2 hospitals*
- Inclusion if >2 months on ART and informed consent
- Questionnaire administered and physical examination conducted

Methods (2)

- Child comforted
- Blood for lactate and triglyceride levels obtained through finger-prick for Accutrend testing at point-of-care
- Normal value >2 mmol/L for lactate and >2.3 mmol/L for triglycerides

Methods (3)

- Normal lactate --> continue treatment
- Mildly/moderately elevated --> follow-up measurement after 2 weeks if asymptomatic, or change treatment if symptomatic
- Severely elevated --> change or interrupt treatment

Demographic characteristics

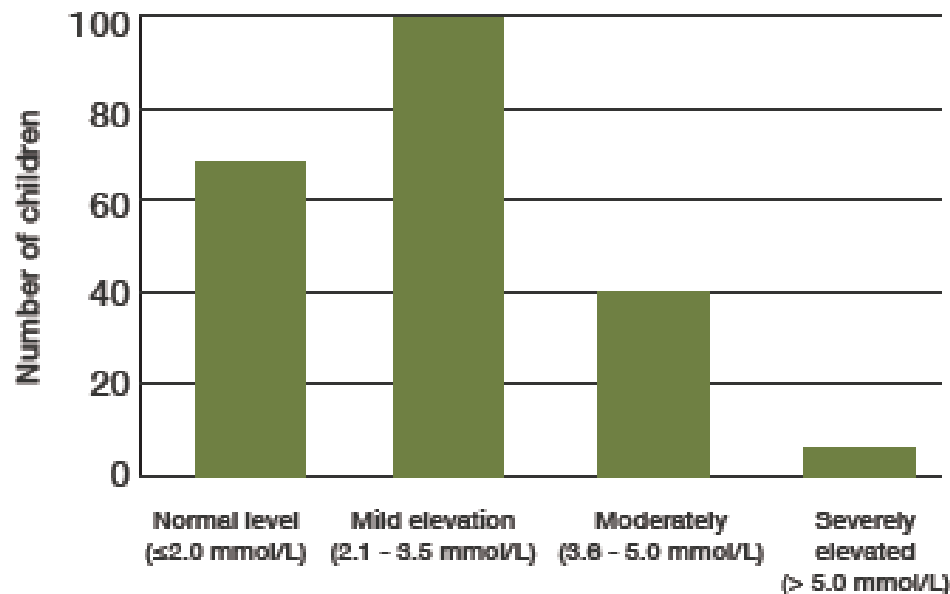
Table 1. Characteristics of study population (n=213)

Male	109 (51)
Age (years)	7.3 (0.6-14.9)
Staying with mother	127 (60)
Caretaker literate	146 (69)
Attending (pre)school	155 (72)
Treated at PHC	178 (84)
Age start ART (years)	5.1 (0.2-13.4)
Time on ART (months)	21 (2.0-77)
D4T-based regimen	171 (83)
TB treatment	6 (3)
Cotrimoxazole prophylaxis	115 (54)
Isoniazid prophylaxis	14 (7)

NB. Data are provided as number (%) or median (range)

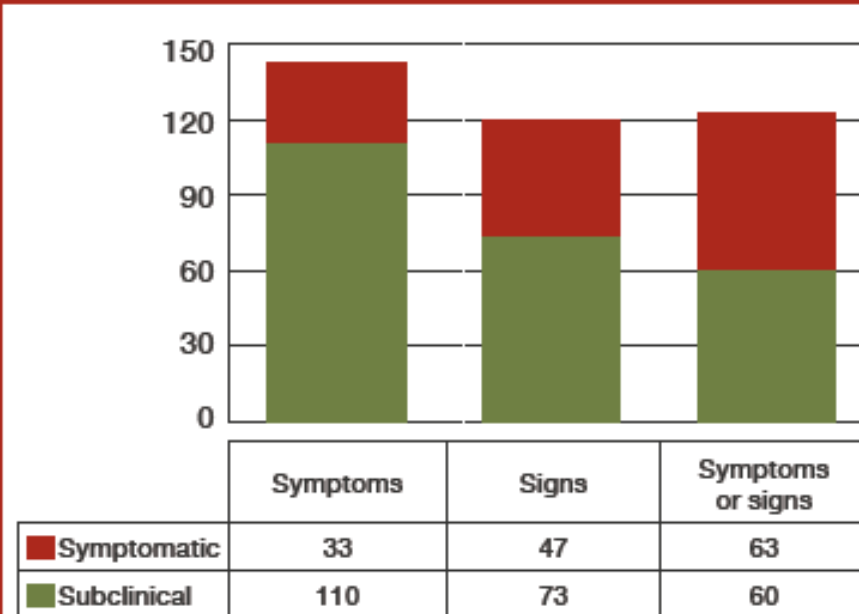
Distribution of lactate levels

Figure 1. Classification of blood lactate level after follow-up visit (n=213)



Signs and symptoms

Figure 2. Presentation of children with hyperlactataemia



- **Symptoms:** chronic (≥ 30 days) diarrhoea, abdominal pain or nausea/vomiting, persistently (≥ 3 months) painful muscles, reduced appetite and food intake, and reduced energy level compared to other children
- **Signs:** documented weight loss in past 6 months, reduced motor milestones in children <3 years of age and abnormal muscle function or muscle strength test in children >3 years of age



Risk factors

		Univariate analysis		Multivariate analysis	
Variable	Frequency (%) or median	Crude OR (95% CI)	P-value	Adjusted OR (95% CI)*	P-value
Age (years)	7.3	-	0.028		
Gender (male)	51	1.1 (0.62-2.0)	0.72		
Grant as main source of income	62	1.4 (0.76-2.5)	0.29		
Mother as caretaker	60	1.1 (0.59-1.9)	0.83		
ART at PHC facility	84	0.70 (0.31-1.6)	0.40		
Age at start ART (years)	5.1	-	0.003		
Baseline CD4 count (cells/mm ³)	378	-	0.085	0.999 (0.998-1.0)	0.003
D4T-containing regimen	80	1.4 (0.70-2.8)	0.34		
ABC-containing regimen	13	0.77 (0.33-1.8)	0.54		
AZT-containing regimen	7	0.68 (0.23-2.0)	0.57		
PI-containing regimen	24	0.82 (0.42-1.6)	0.55		
Time on ART (months)	21	-	0.18	0.976 (0.954-0.998)	0.031
TB Treatment	1.9	1.4 (0.15-14)	1.0		
Co-trimoxazole prophylaxis	54	1.3 (0.72-2.3)	0.39		
Isoniazid prophylaxis	7.6	0.55 (0.18-1.7)	0.36		
Suspected bacterial infection	16	1.6 (0.70-3.8)	0.25		
Lipodystrophy	20	3.4 (1.4-8.6)	0.006	4.0 (1.2-13)	0.023
Peripherhal neuropathy	18	0.91 (0.43-2.0)	0.82		

Conclusions

- Hyperlactataemia is common side-effect in children on ART
- Considerable number with clinically relevant hyperlactataemia
- Best management of mildly elevated lactate levels still unclear

Conclusions

- Lipodystrophy often missed during routine visits and picked-up during study screening
- Children on ART for longer time and those with lipodystrophy at increased risk
- Increased awareness required of HCW of symptoms of elevated lactate followed by blood testing for confirmation

Nkomo!!

Please include nice picture....