Incidental anaemia in patients started on antiretroviral therapy in Harare, Zimbabwe: A cohort study

L. Mandikiyana Chirimuta[1], C. Chimbetete[1,2], T. Shamu[1,3,4], C. Part[5]

[1]Newlands Clinic, Harare, Zimbabwe, [2]University of Geneva, Geneva, Switzerland, [3]University of Bern, Institute of Social and Preventive Medicine, Bern, Switzerland, [4]University of Bern, Graduate School of Health Sciences, Bern, Switzerland, [5]LSHTM, Faculty of Epidemiology and Population Health, London, United Kingdom

Background

- Although antiretroviral treatment (ART) reduces the prevalence of anaemia, some patients remain at risk of developing anaemia after commencing ART.
- Anaemia is associated with disease progression, reduced quality of life and mortality in people living with HIV (PLWHIV).
- We estimated the incidence of anaemia after ART commencement and identified associated risk factors for anaemia in a cohort of PLWHIV

Methods

- A retrospective cohort study of patients at Newlands Clinic, Harare, Zimbabwe was done
- Patients who started ART between January 2016 and December 2020 were included and were followed up for 104 weeks after ART commencement.
- Anaemia was defined according to the World Health Organisation (WHO) age and sex specific reference ranges of haemoglobin.
- Cox regression was used to assess for independent risk factors for anaemia.

Results

- 1,110 patients ≥ 5 years old, were commenced on ART during the study period.
- The prevalence of anaemia at ART commencement was 40.0%.
- After excluding patients with prevalent anaemia at ART commencement, incomplete full blood count blood results, and pregnant women, 529 patients were included in the analysis (*see Fig. 1*) with a total follow up time of 823.7 person-years.
- The median age was 36.1 years (IQR 27.0 - 44.6) and 290 (58.4%) were female.
- The incidence rate of anaemia after ART commencement was 176.1 per 1,000 person-years (95% CI 149.6-207.2) with 146 (27.6%) of the participants developing anaemia during follow up.
- The median time to developing anaemia after ART commencement was 48.1 weeks (IQR 24.1–91.5).
- Of those with incidental anaemia, 79.6% had normocytic,13.6% had macrocytic and 6.8% had microcytic anaemia.
- Female patients (aHR 2.09 95% CI 1.46-3.00, p=0.001), zidovudine use (aHR 3.50 96%CI 2.14-5.71, p=0.001), and the presence of WHO stage III/IV disease (aHR 2.19 95% CI 1.14-5,71, p=0.02) had higher risks of developing anemia.
- Age was protective with the aHR decreasing with increasing age (*see Table*)

Conclusion

- One in four participants a year developed anaemia.
- Female sex, zidovudine use, and the presence of WHO stage III/IV disease were independent risk factors for developing anaemia.
- Further research is needed to assess the impacts of a high incidence of anaemia on, quality of life and comorbidities in this cohort of PLWHIV.

Acknowledgements

- We acknowledge the staff and patients at Newlands Clinic

" One in four participants, a year, developed anaemia after commencing ART"

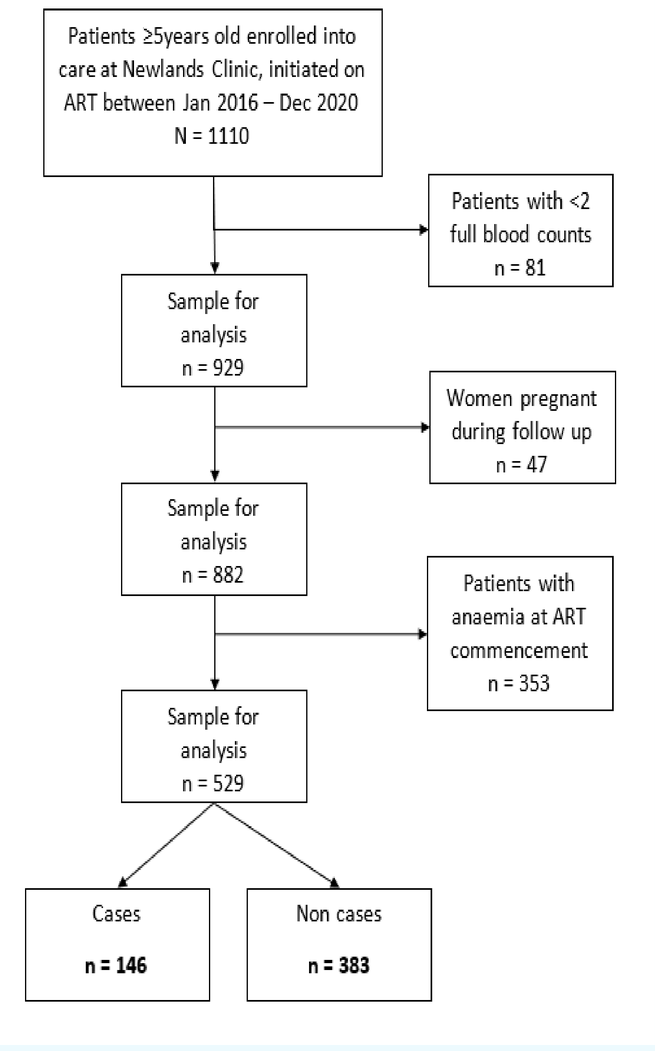

Figure 1. Study flow diagram

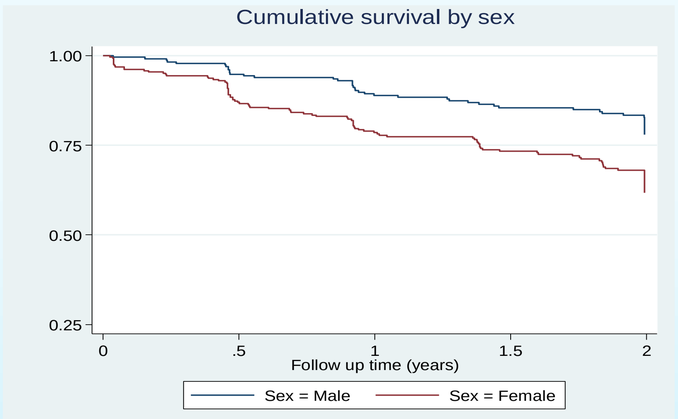

Figure 2. Kaplan Meier survival estimates, by sex. Log rank p-value = 0.001

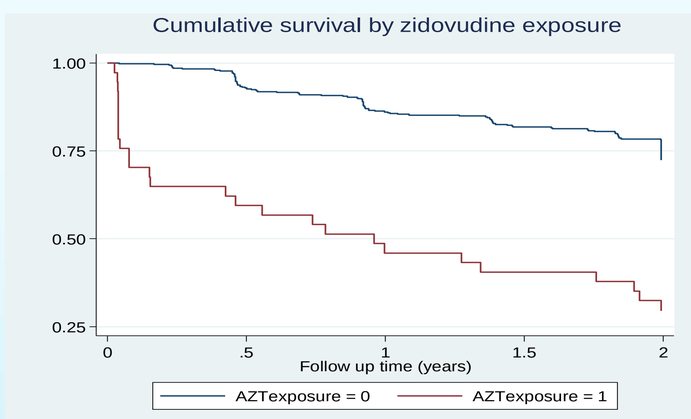

Figure 3. Kaplan Meier survival estimates, by exposure to zidovudine. Log rank p-value = 0.001

Table: Crude and multivariable analysis of HIV incidence associated factors

Variables	N with incidental anaemia*	Person years at risk	Crude incidence rate (95% CI) per 1000 person years	Crude analysis Hazard ratio (95% CI) P value	Multivariable analysis aHazard ratio (95% CI) P value
All individuals	146 (27.6%)	823.7	176.1 (149.6-207.2)		
Sex					
Male	46	392.0	117.4 (88.0-156.7)	1.00 (Reference)	1.00 (Reference)
Female	100	431.7	231.6 (190.4-281.8)	2.98 (1.40-2.81) 0.001	2.09 (1.46-3.00) 0.001
Age					
5 – 12 years	13	16.6	785.4 (456.0–1352.6)	1.00 (Reference)	1.00 (Reference)
13 – 24 years	28	137.8	203.1 (140.3-294.2)	0.25 (0.13-0.48) 0.001	0.43 (0.20-0.92) 0.029
25 – 50 years	90	570.9	157.7 (128.2-193.8)	0.20 (0.11-0.35) 0.001	0.34 (0.17-0.64) 0.002
> 50 years	15	98.4	152.4 (91.9-252.9)	0.19 (0.09-0.40) 0.001	0.25 (2.14-5.72) 0.001
Viral load					
<10 000 copies/ml	39	213.0	183.1 (133.8-250.6)	1.00 (Reference)	1.00 (Reference)
≥10 000 copies/ml	106	600.5	176.5 (145.9-213.6)	0.95 (0.66-1.37) 0.78	0.97 (0.65-1.44) 0.87
CD4 count (Advanced HIV disease)					
≥200 cells/μL (None)	102	570.1	178 (147.4-217.2)	1.00 (Reference)	1.00 (Reference)
<200 cells/μL (advanced HIV disease)	43	247.4	173.8 (128.9-234.4)	0.97 (0.68-1.38) 0.85	1.12 (0.76-1.65) 0.58
Zidovudine exposure					
Not exposed to zidovudine	120	785.8	152.7 (127.7-182.6)	1.00 (Reference)	1.00 (Reference)
Exposed to zidovudine	26	37.8	687.5 (468.1-1009.7)	4.64 (3.03-7.09) 0.001	3.50 (2.14-5.71) 0.001
Underweight					
Not underweight	104	594.4	175.0 (144.4-212.0)	1.00 (Reference)	1.00 (Reference)
Underweight	42	229.3	183.2 (135.4-248.0)	1.04 (0.73-1.50) 0.24	1.23 (0.85-1.79) 0.27
WHO stage III/IV disease					
No WHO stage III/IV disease	136	791.1	171.9 (145.3-203.4)	1.00 (Reference)	1.00 (Reference)
WHO stage III/IV disease	10	32.6	306.8 (165.1-570.2)	1.77 (0.93-3.40) 0.08	2.19 (1.14-4.23) 0.02
Chronic kidney disease					
No Chronic kidney disease	143	807.7	177.1 (150.3-208.6)	1.00 (Reference)	1.00 (Reference)
Chronic kidney disease	3	187.5	187.5 (60.5-581.4)	1.06 (0.34-3.33) 0.82	1.03 (0.31-3.52) 0.95

* Missing values (Viral load – 6 missing, CD4 count – 4 missing)

Presented at AIDS 2022 – The 24th International AIDS Conference

Newlands Clinic

AIDS 2022
29 July – 2 August