Correspondence

Symptomatic Hyperlactatemia: Lessons Learned Using a Point-of-Care Device in a Health Care Center– and Nurse-Based Antiretroviral Program in Rwanda

To the Editor—We read with interest the article by Songa et al. [1], because we are similarly confronted with the frequent occurrence of symptomatic hyperlactatemia/lactic acidosis (SH/LA) in our program in Rwanda. With current efforts to decentralize antiretroviral treatment, most patients will soon receive treatment through health care centers that are staffed mainly by nurses and that have fewer diagnostic tools available. Songa and colleagues encourage field-testing of point-of-care devices (POCDs) in Africa. We report our experience with access to a POCD at a health care center– and nurse-based antiretroviral treatment program.

Médecins Sans Frontières started offering antiretroviral treatment on a decentralized level in Rwanda in 2003, supporting 2 urban government clinics in Kigali [2]. The program relies extensively on nurses for provision of care and has seen a fast scaling-up (i.e., >3000 patients have started receiving treatment).

In 2005, a standardized clinical protocol was developed to screen for mitochondrial toxicities. With training and after use of the protocol, nurses developed good clinical skills, initiating treatment changes under medical supervision. A high rate of lipoatrophy was observed [2].

In 2006, a POCD for determination of the lactate level (Accutrend Lactate;

Table 1. Lessons learned in a health care center– and nurse-based antiretroviral treatment program.

Experience with a clinical approach
Given practical training, protocols, and supervision, nurses are able to recognize SH/LA readily and to initiate clinical management
Ready access to care, located in health care centers, encourages early diagnosis
Potential advantages of a POCD for determination of the lactate level
High predictive value of normal or high lactate level (⩾5 mmol/L)
Potential for less switching of treatment regimens (SH/LA can be ruled out)
Potential for more-accurate and earlier diagnosis, with
Less morbidity or mortality and/or shorter therapy interruption
More-controlled treatment interruptions ("tail-protection")
Higher chance of successful rechallenge (particularly zidovudine)
Easy application in health care centers and is user-friendly[a]
Facilitation of training and enhances confidence of medical staff in the diagnosis and management of SH/LA
Potentially cost-effective, by reducing morbidity/mortality and fewer switches to more-expensive drugs
Potential problems with a POCD for lactate testing
Few data on incidence and clinical significance of subclinical hyperlactatemia in Africa
Requirements for sample collection not assessed in antiretroviral treatment programs in Africa include risk of transient or artificial increases in the lactate level caused by, for example, exercise, dehydration, feeding, or infection (e.g., malaria)
Potential for overswitching of treatment (associated with false-positive results) if there is poor clinical judgment or training
Laboratory errors or artificial increases
Poor correlation of symptoms with lactate levels
Frequent occurrence of mimicking conditions
Different case definitions of SH have been used in Africa [1, 5, 6], and the optimal threshold of lactate level for treatment interruption is not known
Although lactate levels correlate with disease severity, substantial variability exists at the individual level [6, 7]
Potential delays in restarting antiretroviral treatment after clinical recovery without clinical benefit
Currently expensive (MSF price, excluding taxes, $226 per machine and $2.3 per test strip)
Requires steady supply of test strips and control solution

NOTE. MSF, Médecins Sans Frontières; POCD, point-of-care device; SH/LA, symptomatic hyperlactatemia/lactic acidosis.

[a] Defined as a device that is hand-held or portable, that requires minimal training, that provides results in ⩽60 s, that can be used with whole blood (finger-prick), that is battery driven (1.5 V), that does not require refrigeration, and for which control solutions for performance checks are available [3].

Roche) [3] was introduced for patients with clinically suspected SH/LA. We used this tool to document 20 cases of SH/LA [4] and to validate our clinical protocol. We note some advantages and concerns regarding this POCD in table 1.

We also reviewed 48 patient files that noted that symptom-triggered determination of the lactate level was performed. For 8 cases (17%), the POCD improved our clinical management significantly: a normal value ruled out the diagnosis, whereas a high value (i.e., $\geqslant$5 mmol/L) confirmed the diagnosis and avoided delays that normally occur during the clinical assessment. For 35 cases (73%), the results did not improve our clinical management; these cases involved mild or moderate symptoms and nonsevere elevations in the lactate level, for which clinical judgment remains pivotal. Such cases present a number of challenges.

The potential for artificial elevations in the lactate level is high [8–10], particularly in a resource-limited setting, where patients often walk for hours in hot weather to visit the clinic and face long waiting periods. Despite recommendations regarding adequate preparation for testing [11], it is challenging to ensure that the patient is well hydrated, has been fasting, and has avoided exercise. Given the unique circumstances in Africa, additional studies are needed to balance the POCD's validity against its feasibility and acceptability [9]. Even then, the true incidence of subclinical hyperlactatemia has to be defined, because this will clearly affect the predictive value of a particular lactate level [12]. Given their nonspecific nature, symptoms suggestive of SH/LA have been shown to correlate poorly with lactate levels and have not consistently improved with switches or interruptions in treatment, making the diagnosis of mild or moderate symptomatic hyperlactatemia challenging and requiring substantial clinical judgement [13–15]. With the significant number of diseases in Africa that can mimic SH/LA on the basis of transient hyperlactatemia, we have to guard against overdiagnosis. On the other hand, with infectious diseases considered to be potential triggers for SH/LA [8, 12], the assumption that subclinical hyperlactatemia rarely progresses to severe disease [9] has to be reassessed in Africa.

Another issue is whether the POCD can assist in the timing of reinitiation of therapy. Although normalization of the lactate level is generally recommended, the optimal time to reinitiation has not been established [9]. We have observed clinical recovery before biochemical recovery and have rarely seen cases of recurrence using our clinical approach. Given the risk of severe infection (particularly tuberculosis) during treatment interruption, returning to antiretroviral treatment as soon as possible is important. Correlation of POCD results and clinical status will be an important operational research question.

The optimal use of a POCD remains to be determined, but if used with a standardized approach and investment in clinical training for nurses, the POCD can be a useful device in resource-poor settings.

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