Journal of Virus Eradication 2019; **5**: 122–124

Revisiting the 'sterilising cure' terminology: a call for more patient-centred perspectives on HIV cure-related research

Luke Newton[1], Raúl Necochea[2], David Palm[3,4], Jeff Taylor[4,5], Liz Barr[6], Hursch Patel[1], Anshula Nathan[1], Jo Gerrard[7], Laurie Sylla[8], Brandon Brown[9] and Karine Dubé[1]*

[1] UNC Gillings School of Global Public Health, Chapel Hill, NC, USA
[2] Department of Social Medicine, UNC School of Medicine, Chapel Hill, NC, USA
[3] Global HIV Prevention and Treatment Unit Clinical Trials Community Advisory Board, University of North Carolina at Chapel Hill, NC, USA
[4] Collaboratory of AIDS Researchers for Eradication (CARE) Community Advisory Board, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA
[5] HIV+Aging Research Project – Palm Springs (HARP-PS), Palm Springs, CA, USA
[6] AIDS Clinical Trials Group (ACTG) Scientific Sub-Committee Representative, John Hopkins University, Baltimore, MD, USA
[7] University of California Riverside School of Medicine, Riverside, CA, USA
[8] defeatHIV Community Advisory Board, Seattle, WA, USA
[9] Center for Healthy Communities, Department of Social Medicine, Population and Public Health, University of California Riverside School of Medicine, Riverside, CA, USA

Abstract

The literature on HIV therapeutics research is rife with terminology associating 'sterilisation' with HIV cure. We find connotations of the word 'sterilising' problematic for the HIV cure research field. In this viewpoint, we review associations of sterilising with concepts of disinfection or cleansing, as well as coerced sterilisation. We discuss emerging findings from socio-behavioural research that show aversion from people living with HIV towards the 'sterilising cure' nomenclature. We call for more collaborations with people with HIV as partners to help define what would be a more acceptable terminology for describing an HIV cure.

Keywords: HIV cure research, sterilising cure, terminology, patient centredness

Viewpoint

HIV cure-related research is riddled with language such as 'sterilisation' or 'sterilising' in relation to HIV therapeutics. The literature often juxtaposes a 'sterilising cure' (where the replication-competent HIV provirus is completely eliminated from the body) against a 'functional cure' (where there is durable suppression of viral replication in the absence of antiretroviral therapy) [1,2]. After undergoing an allogeneic haematopoietic stem cell transplantation from a donor with a CCR5Δ32/Δ32 mutation, Timothy Ray Brown, commonly known as the Berlin Patient, has had no detectable plasma HIV RNA for more than 12 years and is considered to have experienced a successful sterilising cure [3,4]. Terms such as sterilising cure, 'sterilising immunity' and 'sterilising protection' are also commonplace within the literature on HIV cure development strategies, including cell and gene therapy, stem cell transplantation and HIV-1 vaccine development [1,2,5–13]. Here, we note two major problems with the sterilising cure terminology: (1) the connotations with disinfection or cleansing and (2) the association of sterilisation with making infertile. Forced sterilisations that have been historically perpetrated on women of colour and women with HIV lead to associations of the word sterilisation with coercion. We call for more involvement of people living with HIV to help define appropriate HIV cure research terminology.

Sterile originates from the Latin word *sterilis*, meaning 'unfruitful' [14]. The word sterile has a long association with medicine, first in the context of bacteriology research. Most famously, in 1880, Louis Pasteur presented the French Academy with his thesis that microscopic organisms that entered the body could produce toxins that lead to local inflammation and systemic illness. Antiseptic substances, such as carbolic or boric acid, could be used to sterilise bodily areas where such contamination was likely (e.g. wounds). These substances could also be used to thoroughly clean environments and tools in the care of the ill, giving rise to aseptic techniques that are commonplace today [15]. In its earliest medical appearance, then, *to sterilise* alluded to the goal of preventing the proliferation of harmful micro-organisms, rather than to their absolute destruction. Today, sterilisation is often used in reference to cleaning objects. For example, World Health Organization 1989 guidelines describe sterilisation of medical objects as a means to disinfect instruments exposed to the HIV virus [16]. Disinfection and sterilisation of instruments in healthcare guidelines and medical research is also prevalent in the scientific community [17].

While the rising field of bacteriology popularised one meaning of sterilisation, the growing specialty of gynaecology helped popularise another. New gynaecological procedures, including ovariotomies in the second half of the 19th century (and later hysterectomies), were intended to treat a variety of female illnesses, from mental exhaustion to cancer [18]. Sterility, as in the inability to become pregnant, was one of the unintended effects of these procedures. However, it was not until the 1920s that eugenic policies in the USA and Europe made sterility a purposeful outcome of medical interventions intended to prevent the reproduction of those deemed unfit [19]. Sterilisation became associated with harmful and unfair interventions in the reproductive health of vulnerable individuals and populations, and reports of coerced sterilisation have continued to emerge in scholarly and journalistic sources [20]. The scientific literature includes sterilisation as cleansing in the 'name of public health' as associated with the eugenics movement [21]. The legal and moral implications of using sterilisation as a public health tool for the mentally disabled were discussed in an article as recently as 2018 [22]. Sterilisation as rendering unable to reproduce, often associated with forced sterilisation of women (typically from racial or ethnic minorities or lower financial classes), is widespread in the literature [23–25]. Coerced sterilisation exists when '…misinformation, intimidation tactics, financial incentives, or access to health services are used to compel individuals to accept the procedure, such as tubal ligation' [25]. Forced sterilisation has also been used to limit mother-to-child transmission of HIV in nations

*Corresponding author: Karine Dubé
UNC Gillings School of Global Public Health,
4108 McGavran-Greenberg Hall, Chapel Hill, NC, 27516
Email: karine_dube@med.unc.edu

such as Chile, Namibia and South Africa, violating the principle of respect for human autonomy and researchers' and clinicians' duties to provide informed consent [26,27]. Forced sterilisation is a discriminatory action, and the refusal of certain governments to acknowledge this undermines the abolition of the practice and propagates the idea that women deemed 'unworthy' should not have the ability to procreate [28]. Given these associations, we posit that using the term sterilising in relation to HIV cure-related research may engender distrust of researchers and the HIV cure research enterprise, as lay audiences may associate the term with targeting groups for sterilisation because they may be perceived by some as unworthy.

Furthermore, the linking of sterilising and 'HIV cure' appears to be a unique-to-HIV phenomenon. To our knowledge, there is no equivalent reference to sterilisation as complete elimination of a pathogen in the human body with other infectious diseases (e.g. tuberculosis, syphilis, nor hepatitis B virus, which is similar to HIV in that it is a virus that integrates inside the human genome) [29–31]. Emerging, yet limited, socio-behavioural research in the USA explored the term sterilising cure with people living with HIV, revealing negative connotations for respondents [32]. In focus groups with people living with HIV, the sterilising cure concept was reminiscent of sexual sterilisation, including historical forced sterilisation of poor women of colour and, more recently, forced sterilisation of women infected with HIV [32]. Such connotations are problematic if we are to build trust and invite people to become engaged in the HIV cure research enterprise. It has been well documented that women remain under-represented in HIV research generally, and HIV cure-related research specifically [33,34]. A diversity of strategies is needed to remedy this under-representation, including attention to the potential unintended consequences of language choices.

We need more collaborative research with people living with HIV as partners to determine what would be appropriate nomenclature to define various concepts associated to HIV cure-related research, such as the complete elimination of HIV from the body. We must also appreciate what people living with HIV would conceive to be an acceptable biomedical HIV cure, based on their life experiences and those of their partners and respective communities [35–37]. As most language relies on metaphor to communicate, strides must be made to use patient-centred metaphors that focus on the well-being of people living with HIV [38–40]. In efforts to combat stigmatising language, the terminology surrounding HIV has consistently evolved towards people-centred language. For example, the expression 'people living with HIV' is seen as much more respectful than 'HIV-infected patients' or 'AIDS victims', and 'study participants' is preferred over 'subjects' [41]. Over the last 30 years, people living with HIV have been actively advocating to shift the HIV narrative by adjusting the language to be respectful, non-judgemental and inclusive. They have also played a critical role in modifying the societal discourse on HIV from its stigmatising nature towards a more empowering one [42].

The language used to describe HIV cure-related research matters [43,44]. When contemporary biomedical experts discuss and propose a sterilising cure for HIV, they are of course invoking the aspirations of 19th century bacteriology to eliminate a pathogen, rather than those of 20th century eugenics. Unfortunately, it may be the latter that most resonates with contemporary stakeholders when faced with the notion or the prospect of a sterilising cure. At the very least, the continuous use of sterilising cure suggests a level of historical tone-deafness to the stigma attached to reproductive sterilisation and to the internalised stigma many people with HIV carry related to being 'infected' or 'unclean'. Importantly, a sterilising cure signals an arbitrary narrowing down of the language of HIV/AIDS cure-related matters to an old Eurocentric bacteriology paradigm. We believe the sterilising terminology is caustic and potentially derogatory in its connotations to disinfection, eugenics and forced sterilisation. We recognise there is no clear choice for a desirable replacement for sterilising cure. In fact, we were unable to come to a consensus on alternative language, and we do not have the authority to prescribe new terms for the field. Potential alternative words (such as 'complete cure' or 'classic cure') may harken back to the bacteriology paradigm that gave rise to sterilising cure in the first place. Although the expression 'complete elimination of replication-competent HIV' is an apt description of the scientific goal in question, it is cumbersome. We believe we need to further engage community members to develop possible alternative language that will be acceptable to all.

To describe HIV cure-related interventions, we will need to enrich our language by welcoming the preferences and theorising of people living with HIV. Additionally, rather than researchers suggesting terminology that will be replicated in the future, we propose asking people living with HIV what they would like the language to be – either by actively encouraging meaningful dialogue or integrating social sciences methods as part of biomedical research efforts focused on HIV cure discovery. Only then can we be sure that people living with HIV – in close collaboration with biomedical researchers, social scientists and bioethicists – and not researchers alone, arrive at an acceptable terminology. Further empirical research and discussion regarding the effects of language are also necessary to create an empowering landscape that encourages thorough understanding of what the HIV cure research agenda as a whole, and specific studies in particular, have to offer, and how people living with HIV see themselves fitting in.

References

1. Xu W, Li H, Wang Q *et al.* Advancements in developing strategies for sterilizing and functional HIV cures. *Biomed Res Int* 2017; **2017**: 6096134.
2. Spragg C, De Silva Feelixge H, Jerome KR. Cell and gene therapy strategies to eradicate HIV reservoirs. *Curr Opin HIV AIDS* 2016; **11**: 442–449.
3. Allers K, Hütter G, Hofmann J *et al.* Evidence for the cure of HIV infection by CCR5Δ32/Δ32 stem cell transplantation. *Blood* 2011; **117**: 2791–2799.
4. Yukl S, Boritz E, Busch M *et al.* Challenges in detecting HIV persistence during potentially curative interventions: a study of the Berlin patient. *PLoS Pathog* 2013; **9**: e1003347
5. Nishimura Y, Igarashi T, Haigwood NL *et al.* Transfer of neutralizing IgG to Macaques 6 h but not 24 h after SHIV infection confers sterilizing protection: implications for HIV-1 vaccine development. *Proc Natl Acad Sci U S A* 2003; **100**: 15131–15136.
6. Heeney J, Teeuwsen V, van Gils M *et al.* B-chemokines and neutralizing antibody titers correlate with sterilizing immunity generated in HIV-1 vaccinated macaques. *Proc Natl Acad Sci U S A* 1998; **95**: 10803–10808.
7. Campbell D, Li P. Sterilization of HIV with irradiation: relevance to infected bone allografts. *Aust N Z J Surg* 1999; **69**: 517–521.
8. Katlama C, Deeks SG, Autran B *et al.* Barriers to a cure for HIV: new ways to target and eradicate HIV-1 reservoirs. *Lancet* 2013; **381**: 2109–2117.
9. Maartens G, Celum C, Lewin S. HIV infection: epidemiology, pathogenesis, treatment, and prevention. *Lancet* 2014; **384**: 258–271.
10. Bruner KM, Hosmane NN, Siliciano RF. Towards an HIV-1 cure: measuring the latent reservoir. *Trends Microbiol* 2015; **23**: 192–203.
11. Hu W, Kaminski R, Yang F *et al.* RNA-directed gene editing specifically eradicates latent and prevents new HIV-1 infection. *Proc Natl Acad Sci U S A* 2014; **111**: 11461–11466.
12. Kent SJ, Reece JC, Petravic J *et al.* The search for an HIV cure: tackling latent infection. *Lancet Infect Dis* 2013; **13**: 614–621.
13. Pham H, Mesplede T. The latest evidence for possible HIV-1 curative strategies. *Drugs Context* 2018; **7**: 1–14.
14. English Oxford Living Dictionaries. Sterile. 2019. Available at: https://en.oxforddictionaries.com/definition/sterile (accessed January 2019).
15. Pasteur L. On the extension of the germ theory to the etiology of certain common diseases. In: Rothman D, Marcus S, Kiceluk S (eds) *Medicine and Western Civilization*. New Brunswick: Rutgers University Press, 1995, pp 253–257.
16. WHO. Guidelines on sterilization and disinfection methods effective against human immunodeficiency virus. Geneva; 1989. Available at: http://apps.who.int/iris/bitstream/handle/10665/41538/WHO_AIDS_2.pdf;jsessionid=CF0D52BC59A9AA512154FE1E4145DB98?sequence=1 (accessed January 2019).
17. CDC. Guideline for disinfection and sterilization in healthcare facilities. 2008. Available at: www.cdc.gov/infectioncontrol/pdf/guidelines/disinfection-guidelines.pdf (accessed January 2019).

18. Moscucci O. *The Science of Women: Gynecology and Gender in England, 1800–1929*. Cambridge: Cambridge University Press, 1990. 278 pp.
19. Kevles D. *In the Name of Eugenics. Genetics and the Use of Human Heredity*. New York: Alfred A. Knopf, 1985. 448 pp.
20. Grekul J, Krahn A, Odynak D. Sterilizing the 'feeble-minded': eugenics in Alberta, Canada, 1929–1972. *J Hist Sociol* 2004; **17**: 358–384.
21. Stern AM. Sterilized in the name of public health. Race, immigration, and reproductive control in modern California. *Am J Public Health* 2005; **95**: 1128–1138.
22. Hall S, Griffin D. Public health and sterilization of the mentally disabled: under what circumstances should it be scrutinized versus granted by court order? *Law School Student Scholar* 2018; **938**:
23. Lawrence J, Quarterly AI, Summer N. The Indian Health Service and the Sterilization of Native American Women. *Am Indian Q* 2007; **24**: 400–419.
24. Mallet J, Kalambi V. The forced and coerced sterilization of HIV-positive women in Namibia. *HIV AIDS Policy Law Rev* 2009; **13**: 26.
25. Kendall T, Albert C. Experiences of coercion to sterilize and forced sterilization among women living with HIV in Latin America. *J Int AIDS Soc* 2015; **18**: 1–7.
26. Bi S, Klusty T. Forced sterilizations of HIV-positive women: a global ethics and policy failure. *AMA J Ethics* 2015; **17**: 952–957.
27. Nair P. Litigating against the forced sterilization of HIV-positive women: recent developments in Chile and Namibia. *Harv Hum Rights J* 2010; **23**: 223–231
28. Patel P. Forced sterilization of women as discrimination. *Public Health Rev* 2017; **38**: 1–12.
29. Lönnroth K, Castro K, Chakaya J *et al*. Tuberculosis control and elimination 2010-50: cure, care, and social development. *Lancet* 2010; **375** (**9728**): 1814–1829.
30. Kamb M, Newman L, Riley P *et al*. A road map for the global elimination of congenital syphilis. *Obstet Gynecol Int* 2010; 312798.
31. Nassal M. HBV cccDNA: viral persistence reservoir and key obstacle for a cure of chronic hepatitis B. *Gut* 2015; **64**: 1972–1984.
32. Sylla L, Evans D, Taylor J *et al*. If we build it, will they come? Perceptions of HIV cure-related research by people living with HIV in four U.S. cities: a qualitative focus group study. *AIDS Res Hum Retroviruses* 2018; **34**: 56–66.
33. Curno MJ, Rossi S, Hodges-Mameletzis I *et al*. A systematic review of the inclusion (or exclusion) of women in HIV research: from clinical studies of antiretrovirals and vaccines to cure strategies. *J Acquir Immune Defic Syndr* 2016; **71**: 181–188.
34. Gianella S, Tsibris A, Barr L, Godfrey C. Barriers to a cure for HIV in women. *J Int AIDS Soc* 2016; **19**: 1–10.
35. Ma Q, Wu F, Henderson G *et al*. 'I can coexist with HIV': a qualitative study of perceptions of HIV cure among people living with HIV in Guangzhou, China. *J Virus Erad* 2016; **2**: 170–174.
36. Moodley K, Staunton C, de Roubaix M, Cotton M. HIV cure research in South Africa: a preliminary exploration of stakeholder perspectives. *AIDS Care* 2015; **121**: 1–4.
37. Dubé K, Taylor J, Sylla L *et al*. 'Well, it's the risk of the unknown … right ?': a qualitative study of perceived risks and benefits of HIV cure research in the United States. *PLoS ONE* 2017; **12**: e0170112.
38. Lakoff G. *Metaphors We Live By*. 1st edn. Chicago: University of Chicago Press, 1980. 256 pp.
39. Nie J-B, Gilbertson A, de Roubaix M *et al*. Healing without waging war: beyond military metaphors in medicine and HIV cure research. *Am J Bioeth* 2016; **16**: 3–11.
40. Guta A, Newman PA. Of HIV, kings, and cures: troubling the apocryphal apothecary. *Am J Bioethics* 2016; **16**: 25–27.
41. Brown B, Dube K, Taylor J. Revisiting what to call people who participate in clinical research. PRIM&R Blog. 2017. Available at: https://blog.primr.org/subjects-vs-participants/ (accessed January 2019).
42. Dancy-Scott N, Dutcher G, Keselman A *et al*. Trends in HIV terminology: text mining and data visualization assessment of International AIDS conference abstracts over 25 years. *JMIR Public Health Surveill* 2018; **4**: e50.
43. Rennie S, Siedner M, Tucker JD, Moodley K. The ethics of talking about 'HIV cure'. *BMC Med Ethics* 2015; **16**: 18.
44. Tucker J, Volberding P, Margolis D *et al*. Words matter: discussing research towards an HIV cure in research and clinical contexts. *J Acquir Immune Defic Syndr* 2014; **67**: 110–111.