We all need to know about HIV cure research: a case report

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Abstract

A cure for HIV is not near, yet publicity surrounding the possibility of cure is high. We present the case of an individual with acute HIV who delayed antiretroviral therapy due to misinformed expectations of availability of cure treatments. Researchers and the media need to be mindful of prematurely raising hope of a cure.

Introduction

Current antiretroviral therapy (ART) for HIV infection is very successful [1], but requires life-long adherence. Poor adherence brings the risks of developing drug resistance and long-term toxicity. There is, unsurprisingly, very strong patient demand for a cure to remove the need for continuous medication, limit toxicity and costs, and to remove the risk of onward viral transmission [2]. Basic research has indicated that it may be possible to cure HIV [3–5] and the case of Timothy Brown [6] represents the only example of real life 'cure' of approximately 35.3 million people infected with HIV [7].

Understanding of patient knowledge and reaction to HIV cure research in the UK is limited. We present this case to highlight the need for accurate representation of the status of HIV cure by the media and health providers.

Presentation

A 27-year-old man who has sex with men presented with very early symptomatic acute HIV infection (HIV antibody negative: October 2013, HIV antibody positive: November 2013). His baseline CD4 cell count was 561cells/mL and HIV viral load was 39,137 copies/mL. He reported multiple sex partners of unknown HIV status. During the 1-week interval between HIV diagnosis and physician visit, information-gathering by the individual, principally via the Internet, had provided the overall impression that a cure for HIV was imminent and that clinical trials of cure were being carried out.

His statements included: 'I don't care about the risks of cure treatment – I just want a cure'; 'I cannot live with this virus – there is no life'; 'Antiretroviral therapy is not good enough, I need a cure'. The patient subsequently provided a list of eradication therapies that he believed were available for use through the National Health Service (Table 1). He was informed that no clinical trials were currently under way in the UK and that the interventions listed were in Phase I/II clinical trials and unlicensed. He was offered ART for acute HIV infection as per British HIV guidelines but declined while continuing to research cures. Three visits later, he returned to accept ART, representing a delay of 3 weeks.

Table 1. Eradication therapies suggested by patient

Therapy	Phase of development	Mode of action
Ciclopirox	Phase I	Antifungal. Inhibits HIV-1 gene expression in chronically infected CD4 cell lines *in vivo*
Disulfiram	Phase II	Acetaldehyde dehydrogenase inhibitor. Induces HIV-1 transcription in latently infected CD4 cells
Valproic acid	Phase II	Histone deacetylase 1 inhibitor. Depletes latent infection in resting CD4 cells *in vivo*
Cordycepin	*In vitro*	Analogue of 2′,5′-oligoadenylate. Demonstrates anti-HIV-1 activity *in vitro*
Bryostatin	Phase II	Protein kinase C activator. Induces HIV expression from latently infected CD4 cells
Interleukin 7	Phase II	A cytokine. Promotes CD4 cell survival
Cannabinoids	*In vivo*	Immunomodulators on HIV-1-infected macrophages
Panobinostat	Phase I/II	Histone deacetylase 1 inhibitor. Stimulates HIV-1 expression from latently infected cell lines

Discussion

Strategies for HIV eradication are in Phase I/II trials and a cure is unlikely to be available for a long time. The risks to individuals participating in HIV cure studies are not fully understood and could be high in the short and long term. Pipeline drug approaches include gene therapy, vaccines, histone deacetylase inhibitors, and programmed cell death-1 inhibitors. In the context of well patients and toxic interventions, the ethical issues for cure trials are complex and will require patient understanding of the benefits in the face of potentially large risks that cannot be quantified in advance.

Initiating ART in acute HIV infection is thought to confer the most benefit if initiated within the first 3 months of virus acquisition [8,9], therefore speedy initiation of ART at this time is imperative. The individual presented here experienced a delay in the initiation of recommended ART due to unrealistic expectations of the current status of HIV cure research.

With high levels of patient awareness and expectations, health providers must know the current state of play and limitations of cure research. Importantly, early-phase treatment concepts should never delay the use of proven licensed treatments. Clinician and community involvement is required to manage and educate patient expectations of cure so that it does not distract patients from the uptake of proven antiretroviral therapy. Currently, there is only limited understanding of patient knowledge and reaction to HIV cure research in the UK, in particular across the diverse community of people living with HIV. This is urgently needed and a national survey on patient awareness and expectations of cure will start imminently.

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Learning points:

1. HIV-infected individuals are aware of recent publicity around a cure for HIV.
2. Clinicians need to be aware of realistic timelines and potential interventions for HIV cure.
3. More research is required to understand patient knowledge and expectations of HIV cure research.

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