Justice in Libya? Let Scientific Evidence Prevail

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Editor

In 2001, a report by Yerly et al. in the *Journal of Infectious Diseases* described an outbreak of HIV and hepatitis C virus (HCV) infections that occurred at Al-Fateh Hospital in Benghazi, Libya, in 1998 [1]. This nosocomial outbreak eventually involved >400 children, with 52 deaths having occurred to date. The Libyan representative to the World Health Organization provided plasma samples collected from individuals in the outbreak to the laboratory of Dr. Luc Perrin in Lausanne, Switzerland, in September 1998, and in-depth laboratory investigations were performed on 111 coded specimens. In April 1999, the Libyan government referred an additional group of 37 children and 46 of their parents to Perrin and colleagues at the Geneva and Lausanne University Hospitals, and further investigations were undertaken, including HIV, HCV, and hepatitis B virus serological testing; polymerase chain reaction detection of HIV-1 and HCV RNA; HIV-1 sequencing; HCV genotyping; HCV E2 sequencing; and phylogenetic analyses. HIV-1 infection was confirmed in 96% of the coded specimens and in 100% of the referred children but in only 2% of the parents [1]; HCV infection was confirmed in 49% of the coded samples and in 43% of the referred children but in only 4% of the parents. HIV sequencing determined that sequences formed a monophyletic group closely related to an isolate from a Djibouti patient and was an A/G recombinant virus. HCV genotypes varied and fell into a few distinct clusters.

The data presented in Yerly et al.'s *Journal of Infectious Diseases* article were confirmed and expanded on in subsequent reports [2, 3]. Visco-Comandini et al., reporting on 49 subjects from the Libyan outbreak receiving care in Rome, Italy, also found that a monophyletic HIV-1 A/G recombinant virus had infected all of those studied [2]. Most recently, de Oliveira et al. evaluated both HIV-1 and HCV sequences from the Libyan outbreak and all available reference strains [3]. These investigators from the United Kingdom, the United States, South Africa, Italy, and Switzerland assessed viral phylogenies by use of algorithmic, Bayesian, and maximum-likelihood techniques and once again concluded that the HIV-1 sequences fell into 1 cluster (CRFO2_AG), whereas the HCV sequences formed 3 monophyletic clusters. They also comprehensively analyzed the evolution of these clusters by use of a Bayesian Markov-chain Monte Carlo approach and concluded that the most common recent ancestor for each cluster predated March 1998, sometimes by many years.

Why is March 1998 critical to understanding this outbreak and subsequent events? It was in February and March of 1998 that 5 Bulgarian nurses and a Palestinian doctor began working at Al-Fateh Hospital in Benghazi, together with other health care workers [4, 5]. In February 1999, these 6 individuals, as well as other health care workers, were detained as part of an investigation into the HIV outbreak at the hospital. A year later, in February 2000, the doctor and nurses were accused of deliberately infecting hundreds of Libyan children, and a trial ensued at Tripoli People's Court. The Libyan leader, Col. Muammar al-Gadhafi, claimed that the health care workers had committed a crime on orders from the US Central Intelligence Agency and Israeli Mossad [5]. According to Libyan investigative reports, HIV infections were concentrated in wards in which these health care workers were assigned, and a videotaped search of one nurse's apartment found vials of blood containing HIV antibody. Of note, international investigators Luc Montagnier and Vittorio Colizzi (see below) have seen the results of the Western blot analysis on the plasma in the vials and have called the results indeterminate [4]. One nurse reportedly confessed that the vials of plasma were given to her by a British friend working at a Halliburton subsidiary [5]. At the trial, all defendants pled not guilty, and 2 Bulgarian nurses retracted previous confessions, alleging that they were obtained under torture—charges Libyan authorities deny.

In 2003, the Libyan court requested a report from 2 international experts, Prof. Luc Montagnier, the codiscoverer of HIV, and Prof. Vittorio Colizzi, a Rome microbiologist. In their report, Montagnier and Colizzi concluded that infections with the same HIV-1 subtype were occurring at Al-Fateh Hospital before April 1997, that the transmissibility and virulence of this virus

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strain were high, and that it was being transmitted horizontally within the hospital as a result of invasive procedures, a shortage of disposable materials, and reuse of injection material [6]. An internal investigation by the National Experts Committee, composed of Libyan scientists, denied these conclusions [7].

On 6 May 2004, the Libyan court sentenced the 5 Bulgarian nurses and the Palestinian doctor to death for deliberately infecting 426 children. In December 2004, Bulgaria, Libya, the European Union, and the United States agreed to establish a fund for the affected Libyan families, and the Libyan Supreme Court overturned the death sentences, citing "irregularities" in the arrest and interrogation and sending the case back to a lower court for retrial. Under Libyan law, families may grant clemency in return for compensation [5]. As lawyers and diplomats negotiated the amounts to be paid per infected child, the lower court reconvened during the summer of 2006 but denied requests to hear additional evidence from international scientific experts. Despite this, scientists from around the world made their voices heard in opposition to the continued incarceration, with the efforts including an open letter to Colonel Gadhafi from 114 Nobel laureates [8] and a "plea for justice" from 45 HIV/AIDS investigators [9].

How will this sad and deplorable episode end? Six foreign health care workers have now been jailed in Libya for ~8 years, reportedly tortured, and now once again (on 19 December 2006) sentenced to death. Appeals are being considered, and ransom negotiations continue. Assuming the presumption of innocence as a basis for a fair trial, it must be stated that, by any objective standard, there is no scientific evidence to convict anyone of deliberately infecting unfortunate Libyan children. Moreover, epidemiologic and molecular evidence demonstrates that the HIV strain that caused the nosocomial outbreak was circulating in the hospital before the arrival of the foreign health care workers, and poor hygiene standards, such as the reuse of needles, were reportedly widespread. We can only hope that world pressure will continue until this miscarriage of justice is reversed. As noted by Ahuja et al., what has happened in Libya has sent "a chilling message to all health care workers who choose to work in difficult circumstances to deliver life-saving care to HIV-1–infected or at-risk people worldwide" [9, p. 924]. At a time when enormous progress is being made in the rollout of antiretroviral drugs to the developing world, we can ill afford such chilling messages. Let us all continue to exert whatever individual and collective pressure we can to bring this injustice to an end.

References

1. Yerly S, Quadri R, Negro F, et al. Nosocomial outbreak of multiple bloodborne viral infections. J Infect Dis **2001**; 184:369–72.
2. Visco-Comandini U, Cappiello G, Liuzzi G, et al. Monophyletic HIV type 1 CRF02-AG in a nosocomial outbreak in Benghazi, Libya. AIDS Res Hum Retroviruses **2002**; 18:727–32.
3. de Oliveira T, Pybus OF, Rambaut A, et al. Molecular epidemiology: HIV-1 and HCV sequences from Libyan outbreak. Nature **2006**; 444:836–7.
4. Special report—a shocking lack of evidence. Nature **2006**; 443:888–9.
5. Smith CG. Libya sentences 6 Bulgarian nurses to die in HIV case. The New York Times, 20 December **2006**.
6. Montagnier L, Colizzi V. Report on the Benghazi outbreak. **2006**. Available at: http://www.nature.com/nature/journal/v443/n7114/extref/montagnier.pdf. Accessed 5 January 2007.
7. Final report by the National Experts Committee regarding the scientific expert opinion required in case 607/2003-felonies/Benghaze presented to the Benghazi Appeals Court. 28 December **2003**.
8. Roberts RJ, 113 fellow Nobel laureates. An open letter to Colonel Muammar al-Gaddafi. Nature **2006**; 444:146.
9. Ahuja SK, Aiuti F, Berkhout B, et al. A plea for justice for jailed medical workers. Science **2006**; 314:924–5.