

Human immunodeficiency virus in Saudi Arabia

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ABSTRACT

The human immunodeficiency virus (HIV) type 1 has evolved as one of the most important global infectious pathogens. Although the virus had initially emerged among certain high risk groups in developed countries, it quickly gained momentum in developing countries threatening most population groups. The first case of acquired immunodeficiency syndrome from the Kingdom of Saudi Arabia was diagnosed in 1984. Twenty years later, by the end of 2003, 1509 patients have been reported to have acquired HIV 1. The majority of the early infected patients have acquired HIV 1 from blood product transfusion. Subsequently, the most prevalent mode of transmission became heterosexual. In this review, the distribution of HIV infected persons, prevalence data, and future outlook are presented. Communities considered conservative are not immune from a sexually transmissible virus that has infected 60,000,000 people globally.

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In 1984, the first case of acquired immune deficiency syndrome (AIDS) in the Kingdom of Saudi Arabia (KSA), was diagnosed and reported from the King Faisal Specialist Hospital and Research Centre in Riyadh, KSA. No one then could have anticipated the extent of this disease in this country. Ironically, 20-years later, no one can reasonably estimate even the prevalence of the virus among high risk groups. Only KSA and Afghanistan could not have an estimate for the number of human immunodeficiency virus infected people by the Joint United Nations Programme on human immunodeficiency virus (HIV)/AIDS and the World Health Organization Regional Office of the Eastern Mediterranean.¹ In this review we attempt to shed some light on HIV/AIDS in KSA and the developments in this global health problem. In a society that is considered conservative, addressing the issue of a pathogen and a syndrome that is linked to sexual promiscuity may not be easy.

The syndrome and the virus. The acquired immune deficiency syndrome epidemic has started in the United States of America in June 1981. Five

cases of *Pneumocystis carinii* (*P. carinii*) pneumonia in young previously healthy homosexual men were reported.² The first of these cases came to medical attention in January 1981.³ The details of these cases and similar cases of cellular immune deficiency were peer-reviewed and published in December 1981.⁴⁻⁶ Three years later, the causative organism was identified as human immunodeficiency virus type 1 (HIV 1).⁷ The main milestones of HIV/AIDS are listed in **Table 1**. It is not clear how and when HIV 1 started infecting human. Antibodies against HIV were found in a serum specimen collected in 1959 in Belgian Congo.¹⁶ Currently, it is more clearly evident how wide spreading is this epidemic.¹⁷ The story of AIDS is not without successes. On the clinical front, antiretroviral therapy has made significant progress over the past decade. It became possible for the first time to revert the mortality trends of AIDS. Highly active antiretroviral therapy (HAART) reduced the incidence of opportunistic infections and mortality of AIDS by 75%.¹⁸ The impact was not limited to the infected patient but also extended to reducing

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Table 1 - Milestone of the HIV/AIDS epidemic.

June 1981	Initial report of 5 cases of <i>Pneumocystis carinii</i> pneumonia in homosexual men from the USA ²
June 1982	First report to suggest potential sexual transmission of the disease ⁸
July 1982	Initial report of disease in hemophiliacs from tainted blood ⁹
September 1982	Term Acquired Immune Deficiency Syndrome (AIDS) used ¹⁰
October 1982	First woman to have acquired the disease heterosexually ¹¹
December 1982	Initial vertical transmission in 4 infants ¹²
May 1983	Isolation of a virus from an AIDS patient ⁷
1984	First case diagnosed and reported in KSA from King Faisal Specialist Hospital and Research Centre, Riyadh ¹³
March 1985	Approval of a commercial test for HIV infection
April 1985	First published report on an AIDS case from Saudi Arabia from King Faisal Specialist Hospital and Research Centre, Riyadh ¹³
July 1985	Screening blood donors for HIV in Saudi Arabia*
1986	Working definition for AIDS released by CDC ¹⁴
1986	First report of 13 cases with AIDS from KSA to WHO ²⁹
1987	Approval of zidovudine, first antiretroviral agent
December 1988	Inception of an HIV clinic at King Fahad Hospital, Al-Baha ¹⁵
October 1989	Inception of HIV service and clinic at King Faisal Specialist Hospital and Research Centre, Riyadh (serving more than 600 patients)
*Records of blood bank, King Faisal Specialist Hospital & Research Centre, HIV - human immunodeficiency virus, AIDS - acquired immune deficiency syndrome	

Table 2 - Prevalence of HIV infection among certain groups in KSA.

Group	Region, time	Prevalence Positive/ screened	%
Mixed patients and donors ³⁴	Jazan, 1984	0/608	0
Mixed patients ³⁵	Riyadh, 1986	0/212	0
Hemophilia ³⁵	Riyadh, 1986	5/17	29
Thalassemics ³¹	Four regions, 1988	5/212	2.4
Sicklers ³¹	Four regions, 1988	0/173	0
Mixed (control) ³¹	Four regions, 1988	0/370	0
Hemophilia ³⁶	Riyadh, not indicated	3/20	15
Mixed patients ³⁶	Riyadh, not indicated	0/203	0
Venereal diseases patients ³⁶	Riyadh, not indicated	0/170	0
Tuberculosis ³⁷	Mixed, 1995-2000	6/178	3.3
HIV - human immunodeficiency virus, KSA - Kingdom of Saudi Arabia			

transmission by reducing viral load. The important achievement for antiretroviral therapy is prevention of perinatal transmission. Newborns of HIV infected women had around 1 in 4 chance of acquiring HIV from their mothers before antiretroviral therapy. This chance has been reduced to around 3% with the use of HAART.¹⁹⁻²¹ Postexposure prophylaxis for health care workers is another success story for preventing HIV 1 transmission in health care setting using antiretroviral therapy.²² On the other hand, the progress on the vaccine front has been significantly slower.^{23,24}

The global epidemic. By the end of 2003, UNAIDS estimated that 40,000,000 people are living with HIV including 2,500,000 younger than 15-years-old. There were 5,000,000 new infections during the year 2003 alone. Global mortality reached 3,000,000 during last year; half a million of them are children. The majority of people living with HIV are in developing countries; 25,000,000 alone in Sub-Saharan Africa, where in some countries 40% of the population are now HIV-infected. The new epidemic areas include China, Indonesia, Central Asian Republics, and North Africa. There are more infected women than ever before in all regions in the world now. In some African countries, one out of every 3 pregnant women is HIV infected.¹⁷ Focusing more closely on the region containing KSA, in its 2003 AIDS epidemic update, the Joint United Nations

Programme on HIV/AIDS indicated that 55,000 persons acquired HIV during 2003 from North Africa and the Middle East bringing the total to 600,000 people living with HIV 1. There is a potential for considerable rise in HIV infections in this region. The acquired immune deficiency syndrome has killed 45,000 people in North Africa and the Middle East in 2003. Sudan is the most affected country. The epidemic has particularly hit the southern region of Sudan. In North Africa and the Middle East, injection drug use seems to be an important route of transmission in many countries. Heterosexual transmission remains the major mode of transmission for the majority of HIV infected persons in North Africa and the Middle East. Surveillance programs are limited, and some risk groups are poorly defined in many countries in the region. It is of major concern that the emerging epidemic in many countries is simply ignored, and prevention efforts are almost nonexistent.

Kingdom of Saudi Arabia. Preliminary census data of 2003 indicate a population of 15,590,000 national and 5,260,000 expatriates living in KSA.²⁵ If the estimates of UNAIDS are close to correct, indicating that 0.3% of the population are HIV infected, then 45,000 people are living with HIV in KSA.²⁶ Yet the last official number of cumulative reported HIV positive cases is 1,509.²⁷ Similar to other countries in the region, there are no sentinel surveillance programs in any high risk groups. In the UNAIDS/WHO Epidemiological Fact Sheet on

Table 3 - Screening blood donors for HIV in KSA.

Report, year, region	N	Positives	% Prevalence
Ashraf, 1984, Jazan ³⁴	85	0	0
Al-Nozha, 1986, Riyadh ³⁵	3100	0	0
Ramia, 1989, Riyadh ³⁶	1000	0	0
Bernvil, 1991, Riyadh ⁴²	19775	1	0.005
Fathalla, 1998, Eastern Province ⁴³	134599	10	0.007
El-Hazmi, 2004, Central Region ⁴⁴	24173	0	0
HIV - human immunodeficiency virus, KSA - Kingdom of Saudi Arabia			

KSA 2002 update, none of the parameters for HIV epidemiology could be estimated.²⁸

Epidemiology. As surveillance data are scarce, scattered reports present the only available data on HIV in KSA. The first case of HIV infection from KSA was reported in 1984.²⁸ Publication of the first AIDS case was in 1985 by Kingston et al¹³ from the King Faisal Specialist Hospital and Research Centre in Riyadh. It was the first reported case from the whole region of the Middle East. A man who presented with a bleeding peptic ulcer requiring multiple units of blood transfusion in 1981, 11 of the transfused units were obtained from a commercial blood product distributor in Miami, Florida, USA. The patient presented with AIDS and *P.carinii* pneumonia in 1984. This was confirmed by pathology of a lung biopsy. The patient was in adult respiratory distress syndrome and died of respiratory failure. In 1986, Harfi and Fakhry²⁹ reported 2 cases of AIDS citing again the role of imported blood from the USA. One of the cases was Kingston's while the other was a 6-year-old boy. He had received 300 ml of blood in 1981 after glucose 6-phosphate dehydrogenase deficiency related hemolysis. He presented in 1984 with fever, diarrhea, and oral thrush. Serology was positive for HTLV III antibodies in 2 different occasions. Total CD4+ T-lymphocytes was 4. Blood importation has almost resulted in an outbreak of HIV in one hospital in Al-Baha. In a region with a population of 400,000, 25 HIV cases were confirmed to have resulted from imported blood transfusion.¹⁵ Blood importation was subsequently banned.³⁰ There is no reason to suspect unique or unusual high-risk groups for acquiring HIV 1 in KSA compared to other countries. However, some of these groups remain poorly identified in the community due to the religious and sociocultural norms of the society. These groups are injection drug users, commercial sex workers, and men having sex with men (MSM).

Table 4 - Risk factors for acquiring HIV 1 in Saudi patients.

Risk factor	KFSH&RC ³³	National ²⁷
Number of cases	410	1509
Females	(33)	(23)
Hemophilia	(14)	
Heterosexual	(46)	(45)*
Men having sex with men	(5)	
Injection drug use	(2)	(2)
Perinatal	(12)	(6)
Blood transfusion	(12)	(20)+
Organ transplantation	(2)	
Unknown	(8)	(27)
* Including homosexual transmission, + Including hemophiliacs HIV1 - human immunodeficiency virus type 1 KFSH&RC - King Faisal Specialist Hospital & Research Centre		

Otherwise, multi-transfused patients have contributed the majority of cases during the initial 10-years of the epidemic. Hemophiliacs, thalassemics, and blood transfusion recipients were the main first victims of HIV 1 in KSA.^{15,31,32} Subsequently, extramarital heterosexual exposure to high risk commercial female sex workers has evolved as the main risk factor contributing to HIV infection among Saudi men. Men who are HIV infected irrespective of the acquisition mode transmitted the virus to their spouses who gave it to their children.

In spite of paucity of surveillance data on HIV in KSA, screening for HIV among some risk groups, patients, and blood donors has been performed early in the epidemic. One of the earliest screening projects was carried out in Jazan in 1984. Ashraf et al³⁴ screened 608 people for blood-borne viruses including HTLV III. Around 48% were out-patients, the remainder were school children, blood donors or pregnant women. None had positive serology for HTLV III. Subsequently few other reports were published from Riyadh and other regions. They mainly focused on high risk groups who had blood products multi-transfusion including hemophiliacs, thalassemics, patients with venereal diseases, and hemodialysis patients.^{31,35,36} The summary of the finding are tabulated in **Table 2**. Only hemophiliacs and in one report thalassemics had evidence of HIV 1 infection. Acknowledging the limitations of these reports being too focal and of a small sample size, they point to blood product transfusion as the sole factor contributing to HIV 1 transmission in KSA during the 80s. For the 90s, only one report looked at HIV 1 seroprevalence among patients with tuberculosis (TB). Among 178 patients with TB, 6 (3.3%) were HIV 1 positive.³⁷ The prevalence studies in high risk groups are also limited. In a report from a drug dependence center in Jeddah, KSA during 1995 and 1996, 4 patients had Western

Blot confirmed HIV 1 infection among the 2628 admissions, a prevalence rate of 0.15%.³⁸ No data are available for other high risk groups. Prevalence of HIV 1 among blood donors has been reported from various regions. It ranged between 0 and 0.007%. The reported studies are summarized in **Table 3**. In another low risk group, 926 pregnant women in Makkah were negative for HIV 1 antibodies on antenatal screening.³⁹ These data point to extremely low prevalence levels in low risk populations, and low prevalence rates among high risk groups like injection drug users. However, other high-risk groups like MSM and commercial sex workers remain poorly defined in the community and virtually unscreened before. Given the smoldering nature of the initial phase of HIV epidemic, such high risk groups may serve as the component introducing wider HIV spread in few years to come.

Mode of transmission. If high risk groups could not be identified and screened for HIV through surveillance, determining the mode of acquiring HIV 1 in infected persons becomes the sole alternative for recognizing the modes of transmission. So far there are 3 reports on modes of transmission of HIV 1 among Saudis. Two from the same institute and published 10-years apart in peer-reviewed journal,^{32,33} and the third is a press release to media from the Director of the National AIDS Program.²⁷ Our report in AIDS has included patients of the first report of 1993. It details the modes of transmission of 410 Saudi patients as carefully determined for every individual patient. **Table 4** lists the various modes of transmission for these patients compared to the national report of 1509 patients. The few differences include grouping all blood product transfusion in one group in the national report and not separating hemophilia as we did, including all sexual transmission and not separating MSM as we did, and finally not having organ transplantation as we did. The proportions of HIV infected persons who acquired the virus heterosexually and from injection drug use are quite similar in the 2 reports. As we had the patients themselves and not only the reporting form as the National AIDS Program, we managed to minimize the proportion of unknown to 8% only. One of every 3 HIV infected patients is a woman at King Faisal Specialist Hospital and Research Centre in Riyadh, compared to one in every 4 nationally. This may be the reason plus the referral bias for having double the proportion of infected patients who acquired the virus perinatally in our institute. Similar to all developing countries and countries in the Middle East and North Africa, the main route of HIV 1 transmission is heterosexual. Almost 50% of the cumulative cases have been acquired through this route. The source of the virus in heterosexually infected men, and women are vastly different. Ninety percent of the heterosexually infected men

acquired the virus from extramarital exposure to commercial sex workers and only 10% acquired it from their infected wives. For women, 97% of heterosexually infected women acquired the virus from their infected husbands.³³ Organ transplantation, principally kidney, is a peculiar mode of transmission for Saudi patients. This was also noted in several reports from many countries. By 1989, 60 cases of HIV infection after kidney transplantation between 1977 and 1986 were reported.⁴⁰ The rate of HIV seroprevalence among kidney recipients ranged between 0.1-6%. For Saudi dialysis patients, HIV 1 acquisition continued to be a threat even after 1985 if they elected for commercial kidney transplantation. Living non-related kidney donation is illegal in KSA. So many dialysis patients travel abroad for such a transaction. Screening of donors is not always optimal. Among 540 patients who received a commercial kidney between 1977 and 1993, 23 (4.3%) acquired HIV 1. Such infection was associated with poor patient survival.⁴¹ It is not entirely clear that the virus was acquired from the donated kidney. Blood product transfusion peri-transplantation could still have contributed the virus transmission. Screening blood donors may be more stringent compared to commercial kidney donors. India has been the main location for commercial kidney transplantation.⁴¹

In conclusion, available data point to HIV 1 prevalence rates in the Saudi community to remain lower than estimated rates of 0.3%. Based on data from blood donors and patients with TB, seroprevalence in general population may not exceed 0.01%. The potential for increasing HIV spread through injection drug use and high risk sexual practices is considerable given the lack of structured surveillance and prevention programs. Akin to other countries in the region, funding for HIV programs is falling short of meeting the requirements.²⁶ Currently all funding (24,000,000 SR in 2003) seems to be directed towards treatment programs.²⁷

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