EUROPEAN ACADEMIC RESEARCH
Vol. I, Issue 10/ January 2014

ISSN 2286-4822
www.euacademic.org

Impact Factor: 0.485 (GIF)
DRJI Value: 5.9 (B+)

Review Article

Code of Awareness about HIV/AIDS

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Abstract:

Acquired immunodeficiency syndrome (AIDS) is the disease of immune system, caused by human immunodeficiency virus (HIV), which belongs to retrovirus family. During this disease the immune system no longer performs its function and the body falls ill. Due to weaker immune system several opportunistic microorganisms attack on the body and lead to death (if not treated). Recent report (published in 2013) stated that in last decade a tremendous decline in HIV/AIDS

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cases and increase of HIV antiretroviral therapy has been recorded. But still due to this disease up to the end of 2012 about 35.5 million peoples are sick. In Pakistan the first case of HIV was reported in 1987. Later on 920 HIV cases in Pakistan have been recorded. Some publication stated that about 10000-12000 cases are there in Pakistan. HIV is mostly spread through sexual intercourse. It is also spread through blood and blood products (sperm and virginal secretion etc), contaminated instruments, during pregnancy to child, tissue and organ transplant, delivery and breast feeding. HIV is not spread through handshake, sneeze and other ordinary contacts. Enzyme Linked Immunosorbent Assay (ELISA) is used for HIV/AIDS as screening tests, while Western Blot (WB) is used as confirmatory test. Highly active antiretroviral therapy (HAART) is a synergistic drug and is a preeminent drug of choice for HIV/AIDS. This review summarizes the current literature to produce the awareness and update the epidemiology of HIV/AIDS.

Key words: Awareness, AIDS, HIV, Pakistan, literature, epidemiology.

Introduction

HIV stands for human immunodeficiency virus. It belongs to the retrovirus family, which infects and destroys the human immune system (macrophages and CD4 positive T cells). Progressive decline of the immune system due to HIV causes immune suppression. When the immune system no longer carries out its function, it is considered as deficient. Most of the infections are rare or absent in immune competent peoples, while causing infections in immune deficient peoples. Such infections take advantage of the weakened immune system and are called opportunistic infections. AIDS stand for 'acquired immunodeficiency syndrome' and is a condition of disease having signs, symptoms, infections and cancers related to immune deficiency (UNAIDS 1998). HIV is a fatal and incurable disease having amazing social repercussions (Bennett 1987)

Today AIDS is one of the most demanding health

problems in medication. Epidemiological, Neurological, virological and immunological studies stated that HIV is responsible for most of such diseases. (AIDS 1986; Levine 1985).

HIV Risk Factors

The strong factor for HIV transmission is sexual intercourse. It is also spread through blood and blood products (sperms and virginal secretions etc.), contaminated instruments, during pregnancy to child, tissue and organ transplant, delivery and breast feeding. HIV cannot be spread through handshake, sneeze and other ordinary contacts. Heterosexual intercourses are responsible for even larger fraction of cases in developing countries (Bulatao and Bos 1992; World Bank 1997; O'Malley 2002; Robalino et al. 2002). Sexually active youngsters are at privileged threat because most of them have insignificant knowledge about avoidance of HIV infection and health care. Due to greater time of exposure such people face a higher risk of infertility and cervical cancer following by Chlamydial infection. The condition may be asymptomatic therefore their diagnosis is more difficult at this stage (WHO 1996). A study demonstrated that even much educated Pakistani youth has low awareness about sexual transmitted diseases (Raza 1988). Through sexual intercourse worldwide about 75% of all HIV infections occurs.

In the beginning, the homosexual transmission was considered as the main cause of HIV transmission in developed countries. During recent years the evidence is that heterosexual transmission has been raised trends in developed countries (Quinn 1994 and Haverkos 1995). Homosexual transmission is now the main cause of HIV transmission in Caribbean (Wheeler 1994). In Western Europe and North America the ratio of HIV infection is raising gradually among heterosexuals therefore the impact of HIV pandemic is growing in women harshly. Globally

the fraction of HIV infected women adults raised from 25 % to 45 % in 1995. Up to late 1995 nine million women had been infected with HIV.

Global Burden of HIV/AIDS

Although due to screening, diagnostic and treatment plans worldwide the awareness, management and detection of HIV/AIDS increased noticeably over the past decade. But still HIV remains a worldwide disease. UNAIDS estimated in 2009 that about 33.4 million people are infected with HIV, out of them 22.4 million belong to Sub-Saharan Africa (UNAIDS 2009). Only 11 % of the world population belongs to Africa but 67 % of the world HIV patients belong to it (UNAIDS 2009; Steinbrook 2010).

Recently UNAIDS reported in 2013 that up to the end of 2012 the total number of HIV positive patients is about 35.3 million. This report further stated that in last decade a tremendous decline in HIV/AIDS cases (Table 1) and increase of HIV antiretroviral therapy has been recorded. According to this report since 2001 33 % decrease in HIV new infection, since 2005 29 % decrease in AIDS related death (HIV/AIDS related death, Table 2), since 2001 52 % decrease in HIV infection in children and 40-fold increase in access to antiretroviral therapy between 2002 and 2012 recorded. This report further stated that up to the end of 2012 9.7 million of the people belonging to developing countries had access to antiretroviral therapy. 62 % of the HIV positive pregnant women had access to antiretroviral therapy. In many countries this ratio for pregnant women is about 80 %. Worldwide approximately 17.8 million children lost their parents (one or both) due to AIDS. Every hour about 50 young women are getting infected due to HIV (UNAIDS 2013).

S. No	Country	Year	No of HIV cases	Percentage (%) increase or decrease
1	Sub-Saharan Africa	2001	2.6 million	
		2012	1.6 million	40 % decrease
2	Middle East and North Africa	2001	21 000	50 % increase
		2012	32 000	
3	Caribbean	2001	25 000	52 % decrease
		2012	12 000	
4	Latin America	2001	97 000	11 % decrease
		2012	86 000	
5	East Asia	2001	68 000	19 % increase
		2012	81 000	
6	South and South-East Asia	2001	400 000	32.5 % decrease
		1012	270 000	
7	Eastern Europe and Central Asia	2001	140 000	14 % decrease (2001-2006) and then 8 % increase since 2006
		2006	120 000	
		2012	130 000	

Table 1. Region wise distribution of HIV infection.

S. No	Country	Year	No of death	Percentage (%) increase or decrease
1	Sub-Saharan Africa	2001	1.5 million	22 % decrease
		2012	1.2 million	
2	Middle East and North Africa	2001	8300	105 % increase
		2012	17000	
3	Caribbean	2001	24 000	52 % decrease
		2012	11 000	
4	Latin America	2001	82 000	37 % decrease
		2012	52 000	
5	East Asia	2001	18 000	128 % increase
		2012	41 000	
6	South and South-East Asia	2001	220 000	No change
		2012	220 000	
7	Eastern Europe and Central Asia	2001	36 000	153 % increase
		2012	91 000	

Table 2. Region wise distribution of HIV/AIDS related deaths.

HIV/AIDS in Pakistan

In Pakistan the first case of HIV was reported in 1987. Prior to it in 1983, HIV was reported in homosexual men in Los Angeles, USA. (Hayward 1988). Probably HIV transmission was started in Pakistan one decade later than the European countries and United States. Few publications reported that the number of authorized reported cases of HIV in Pakistan is 920, although some health authorities estimated that this number may be 10000 to 12000 (Khanani 1988). Initially HIV/AIDS cases were reported from Karachi. The important factor for HIV transmission in Pakistan is that overseas migrants who become infected with HIV due to blood transmission or sex, come here and accordingly spread it (Mujeeb 1999). About 2 million Pakistani are there in oil rich Arab countries, and due to too expensive migration and low income mostly they are without their families. So these younger men mostly find satisfaction through prostitution, through which mostly they get HIV infection. Recent reports stated that more than 500 cases of these countries were belonging to Pakistani workers (Mujeeb 1991). These facts arise some questions regarding the rights of employers to provide low cost facilities for these workers to accommodate families as well.

HIV/AIDS Prevention

Primary Prevention

For the purpose of obtaining suitable approach for HIV avoidance interventions, a great deal of early behavioral study is needed to find out social, psychological and situational factors linked with high risk sexual or drug use manners practices (Jeffrey et al. 2002). Many consideration studies (e.g. longitudinal cohort studies, cross sectional quantitative and qualitative methods) were done with different population, a comparatively reliable set of high risk manners analyst has

emerged. It consists of risk related cognitive and attitude factors (e.g. false viewpoint about risk, weak intentions to change activities, negative attitudes toward condoms, incorrect outcome expectancies about safer sex and reduced perceived self efficacy for enacting behavior change), poor risk lessening skills (in areas where proper condom use, insolence or sexual cooperation and risk reduction personal problem solving), reduced societal and peer normative supports for risk reduction attitude change and situational factors that help to risk, such as concurrent substance use problems and relationship factors (with method of safer sex more likely in formal, transient, or "first time" partnerships than in affectionate ongoing, or primary relationships) (Kalichman 1998a; Kelly 1995).

O'Donnell, San Doval, Duran, and O'Donnell (1995) stated that specially formed videos consisting of small group, doing conversation on skills building and individual risk reduction, produce positive attitude and intention in people for condom use (O'Donnell et al. 1995). Preceding research found that videos methods of awareness produce reduction in other types of sexual transmitted disease (STD) among clinic patients (O'Donnell, San Doval and Duran 1998). 17 month later, 23 % of men who received the video based instruction had other types of STDs as compared to 27 % of HIV control. Also high risk men having multiple sex partners were studies and found that 25 % of them had succeeding some sort of STDs as compared to 32 % of HIV control (Jeffrey et al. 2002).

Secondary Prevention

"Secondary prevention" is used for those people who already have HIV infection. It means to protect HIV/AIDS patients from the adverse conditions of this disease. Latest developments are in progress regarding the social and emotional adjustment of people having HIV/AIDS. First we give attention to the challenges faced by patients having HIV/AIDS in adjusting to a speedily changing treatment environment,

psychological fitness aspects of better health, and response to HIV treatment. After that we give attention to secondary prevention intercession outcomes, consisting of better emotional and immunological health and to prevent the transmission of HIV/AIDS from infected to healthy persons (Jeffrey et al. 2002).

Diagnosis of HIV/AIDS

HIV Serology

Most HIV infected people produce antibodies, which can be detected within 30 days after infection, by enzyme linked immunosorbent assay (ELISA). In majority of cases antibodies of HIV are detected after three months of infection (Dodd 2009). The window period is the time interval between entry of HIV and production of antibodies. The average window period to detect seroconversion using HIV-1 antibodies test is 22 days for subtype B. Window period is shortened for antigen testing that is 16 days, and 12 days for nucleic acid amplification testing (NAAT) (Dodd 2009). Within the window period a HIV positive person can transmit its virus to a healthy person although antibodies are not detected in his blood. In few cases false positive and false negative tests are also occurring therefore its necessary to perform two or more tests for HIV case. If one test shows positive and another shows negative result then a third test or test using another platform (e.g. NAAT for viral load) should be performed (Kishore et al. 2009).

Enzyme Linked Immunosorbent Assay (ElISA): The Screening test of HIV/AIDS

The first tool for HIV screening is ELISA tests. ELISA test can detect antibodies within 3-6 week after HIV infection. In very few cases antibodies production can take up to 12 weeks after infection. After window period only in few cases ELISA shows false negative tests. After the window period if a person shows false positive tests after the lost potential exposure, the test is

truly negative. In case of false positive test some other auto-antibodies, hepatic disease, acute viral infection, influenza vaccinations are present, or they may be due to errors in laboratory procedure and specimen handling. So for positive ELISA tests confirmatory tests are necessary (Kishore et al. 2009).

Western Blot (WB): The Confirmatory Test

Western Blot (WB) is a confirmatory test, which is performed if rapid or ELISA test is positive, negative or indeterminate. When no viral bands are detected the result is considered as negative. If one or more viral band for each of the POL, GAG, and ENV gene product group is present, the result is positive. In few cases certain viral bands are detected but are not enough to confirm infection and such cases are considered as indeterminate. Mostly those cases which show indeterminate result should be retested and later on after few months they show negative tests. The reasons may be that the first test is positive due to cross reaction with other antibodies (Kishore et al. 2009).

Rapid Testing

Rapid testing is mostly popular in those locations which are at long distance and have limited resources for HIV diagnosis. Such tests can be carried out with low training, and not required costly laboratory equipment for testing or biohazards reagent disposal. This test also gives immediate result, and is mostly used for cases like needle stick injury and pregnant women in labour. Currently mostly negative tests are reported through single test but positive test must be confirmed through standard serological testing (Kishore et al. 2009).

Nucleic Acid Amplification Test (NAAT)

This test is used to detect hereditary material of HIV. Different PCR assay detect highly preserved region of HIV gene. These

assays are so much sensitive and are used for early detection. For example, since 2001 donated blood is tested in USA by nucleocapsid based test. These tests decrease the window period between infection and delectability of virus genome to about 12-15 days. For HIV detection RNA and DNA tests are of two types, qualitative and quantitative. Qualitative diagnostic assays identify infection while quantitative detection identifies the level of circulating copies of HIV nucleic acid for therapeutic or prognostic monitoring (viral load tests). Qualitative HIV DNA PCR tests detect proviral DNA which has been integrated in host cellular DNA. In infants the HIV antibody tests are not suitable up to the first 15 months. In such cases peripheral blood mononuclear cells of the patient are obtained from which DNA is extracted and PCR is performed. Through HIV DNA PCR in newborns HIV infection can identified within 4-6 weeks after birth. In case of utero infection in newborn HIV can be detected through DNA PCR within 48 hours after birth, while in case of labour delivery or breastfeeding HIV can detected after 2-12 week. It is important to identify HIV in infant and to recommend him for early treatment within 3 months, DNA PCR testing is preferred (Kishore et al. 2009).

HIV P24 Antigen Test

For early HIV infection p24 antigen testing may be used. After initial infection within 1-3 week p24 antigen increases significantly. This test can show result before HIV antibody is produced. Antibodies to HIV are produced about 2-8 week after exposure and then can be detected (Kishore et al. 2009).

HIV/AIDS Treatment

Sine clinically AIDS was first identified, systematic and beneficial development has been done. Approximately 6 years was utilized for HIV identification. Sensitive tests were developed to detect infected people during latency period and to

introduce the first successful therapy AZT. However up to now AIDS is out of control especially in poor countries where societal factors are a major problem to struggle against epidemic (Jaffe 2004). Food and drugs administrator (FDA) indicated three target sites for HIV life cycle: proteolytic maturation, reverse transcription and fusion. Highly active antiretroviral therapy (HAART) which is a synergistic drug is nowadays used for HIV treatment. This drug consists of nucleoside reverse transcriptase inhibitor (NRTI), non nucleoside reverse transcriptase inhibitors (NNRTI) and protease inhibitors (PI) (Richman 2001). Mostly HIV patients cannot tolerate HAART. It is expensive, it requires regulation and leads to multidrug resistance (Cohen 2002). It is estimated that anti HIV drug combination is much efficient than single drug use, therefore HAART is considered as the most powerful option for AIDS patients (Richman 2001). Synergistic drug use also decreases the resistance of viruses to that particular drugs, because multiple mutation is produced in the virus decreases the viral strength to produce drug resistance. The hope is that integrase inhibitors will be added to HAART or salvage therapy to suppress drug resistance of HIV.

Conclusion

HIV/AIDS is a pandemic disease, mostly spread through blood and blood products (sperm and virginal secretion etc). Its transmission is due to sexual intercourse, contaminated instruments, during pregnancy to child, tissue and organ transplant, delivery and breast feeding. HIV cannot spread through handshake, sneeze and other ordinary contacts. Awareness regarding HIV/AIDS and prevention principles (condom use during sex with multi sex partner) are necessary to get rid of this disease.

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