CHAPTER 1

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Human beings are characterized by different constitutions. An individual’s constitution embraces characteristics of morphology, physiology and psychology. However, morphology offers the clearest and simplest hunting ground in constitutional research. There are great differences in bodily form amongst humans, and these differences occur in all degrees of detail, from the general size and shape of the individual to the curve of the eyelid or the form of a particular finger. Different builds have different advantages in different circumstances and at different times. Anthropometric measurements nowadays have become important tool in evaluating the change in body size and shape due to illness, level of physical activity and nutritional intake during the long period of adulthood. Physical Anthropology in the olden days was mainly concerned with the study of skeletal parts and metric analysis of different superficial bodily organs but now a days physical anthropologist take into consideration, the internal organs of the human body to study their biochemical constitutions. How the physiology of man interacts with the external factors like disease, climate, food habit, occupation etc is also an important concern of physical Anthropology. This subject can provide a perspective as well as methodological tools that are largely missing in thinking about HIV/AIDS and tuberculosis control strategies. Anthropology provide skills and perspectives to be used to solve problems
and improve services in a variety of health related settings like, health care agencies, clinical settings, community health organization and health policy evaluation. The biomedical prerogative towards cure rather than care and its emphasis on biological and physical rather than the psychological, social and cultural aspects of ill health, especially in HIV/AIDS and tuberculosis means that input from anthropologists and other social scientists are urgently needed in both the planning and evaluation of AIDS and tuberculosis prevention programmes.

1.1 HIV/AIDS

The disease known as AIDS was first reported on 5th June, 1981 amongst a cluster of eight gay man (homosexuals) in the city of Los Angeles, USA. AIDS stand for Acquired Immune Deficiency Syndrome. Acquired means that AIDS is not inborn, not inherited but acquired from outside the human body; Immuno-deficiency means that the body’s defence system has been weakened rendering the person unable to defend himself against diseases. AIDS is not single disease but a syndrome; a group of symptoms or disease processes that together indicates the presence of disease. It has been first described as a new clinical entity in June 1981 by the Centre for Disease Control (CDC), Atlanta, USA (CDC-1981). The term, AIDS; Acquired Immuno Deficiency Syndrome was coined in 1982. An internally agreed clinical definition of AIDS has been drawn up by the Centre for Disease Control (CDC) and the World Health Organization (WHO).

HIV stands for Human Immuno-deficiency virus. Since HIV is the causative organism for AIDS, sometimes it is called AIDS Virus. The Virus was isolated in
1983 by Dr. Luc Montagnier and his team at the Pasteur Institute of Paris, France from the patients with AIDS (Singh, 1998). The International Committee of taxonomy of Viruses has unanimously designated the virus as “Human Immuno-deficiency Virus (HIV) in 1985 (Nicholas-1986). There are two distinct human Immuno-deficiency viruses: HIV-1 and HIV-2. These two types of HIV appear to differ in their ability to caused diseases. HIV-2 is less pathogenic than HIV-1 or have more extended clinical latency period. HIV-2 is largely confined to West Africa while HIV-1 a world wide spread. HIV-2 is least infectious, the incubation period is much longer and the risk of mother to child transmission is very less. In India, 95% of infections are due to HIV-1 and 5% or less is due to HIV-2 (Singh, 2004). People infected with HIV are infectious lifelong. It takes about 7-10 years for the HIV infected person to develop AIDS. Even during this relatively silent asymptomatic period they are infectious. Some HIV-infected individuals progress more quickly than others to HIV-related diseases and AIDS. The rate of progression which depends on the virus and host characteristics include serotype and strain: HIV-1 and certain HIV strains may cause faster progression include age less than 5 years, age more than 40 years, concurrent infections and possibly genetic factors (Training Manual for Medical officer on HIV-AIDS, 2002).

Since the beginning of the global AIDS epidemic, almost 60 million people have been infected with HIV and 25 million people have died of HIV-related causes. In 2008, some 33.4 million people living with HIV, 2.7 million new infected and 2 million AIDS-related deaths. Around 4,30,000 children were born with HIV, bringing to 2.1 million total number of children under 15 living with HIV. Young people
account for around 40% of all new adult (15+) HIV infection worldwide (AIDS, 2009).

The impact of HIV and AIDS is ominous especially for India which is the second most populous country in the world with a population of 1,027,015,247 in 2001, and a country expected to be more populous than even China by the beginning of the next century. A national household survey conducted in 2005-2006, led to a major revision of the prevalence estimate in July 2007. It is reported that around 2.3 million people in India are living with HIV. Of these, an estimated 39% are females and 3.5% children. The spread of HIV in India has been uneven. Although much of India has a low rate of infection, certain places have been more affected than others. HIV epidemics are more severe in the southern half of the country and the far north-east. The highest HIV prevalence rates are found in Andhra Pradesh, Maharashtra, Tamil Nadu and Karnataka in the south; and Manipur and Nagaland in the north-east. Across India HIV prevalence appears to be low among the general population, but disproportionately high among high-risk groups, such as IDUs, female sex workers, men who have sex with men and STD clinic attendees. The average HIV prevalence among women attending antenatal clinics in India is 0.48%. Much higher rates are found among people attending STD clinics (3.6%), female sex workers (5.1%), injecting drug users (7.2%) and men who have sex with men (7.4%). NACO has reported that by the end of 2005 the total number of reported AIDS cases in India was 1,16,905, of which 82,728 were males. Around a third of these were among people younger than 30 years (NACO). The National Family Health Survey conducted between 2005 and 2006 measured HIV prevalence among the general adult population of India and the survey
found the rate among men to be considerably higher than that among women and also found prevalence to be higher in urban areas (0.35%) than in rural areas (0.25%) (NFHS, 2007).

In Manipur, the presence of the AIDS virus was first reported among drug injecting population in the year 1989. He was a 39 years old businessman who was not only injecting drug user but sexually promiscuous too (Pal et al, 1990). Since then the HIV epidemic among injectors has exploded, with sero-positivity rate rising to over 89% by 1994 (ICMR, 1992-95). Though HIV/AIDS was late coming to India, Manipur, one of the states of the Indian Republic was noted for its rapid increase in HIV sero-prevalence rate among its IDU population. In the North-Eastern States, a significant increase of infection among its injecting drug users has now been found to extend to Nagaland, Mizoram and Assam as well. From 50% to 70% of male injecting drug users in Manipur have reportedly engaged in sexual intercourse of which 40% of them had multiple sex partners with very low frequency of condom use requiring confirmation of the heterosexual made of HIV transmission in Manipur. In the states, injecting drug users has public health concern that HIV injection goes on extending to their sexual partners giving rise to the infection rate of 1.5% among antenatal mother (Singh, 1998).

Epidemiological study has shown that HIV transmission in India is primarily among heterosexuals fitting the description of pattern- III. HIV transmission is alarmingly of high prevalence among female sex workers and those men who recently had contact with sex workers (Rodrigues, et al. 1995). However, the pattern has become more complex as the number of infected persons has increased other than the
heterosexual type. Both HIV-I and HIV-II infections were detected in India (Rubsamen Waigmann, et al. 1992).

The presence of Co-infection of HIV-I and HIV-II among drug injecting population in Manipur has shown the impression of international connection in risk behaviours related to HIV transmission (Pal, et al, 1990). He has described the connecting link of drug using culture of Manipur and the rest of the country with the Golden Triangle at the border area of Myanmar, Thailand and Laos. It was postulated that HIV might have transmitted from Thailand to India through Myanmar and North eastern states of India along with the drug trafficking activities in these region. In Manipur, sharing drug injecting paraphernalia was established to be the prime cause of HIV transmission among youths.

1.2 TUBERCULOSIS

Tuberculosis (TB) is an airborne, infectious disease caused by bacteria which primarily affect the lungs. While both preventable and curable, TB remains one of the world’s major causes of illness and death. And in 1993, the World Health Organization (WHO) declared TB to be a global health emergency. Tuberculosis is known to have existed in India from time immemorial, and has been mentioned in the Vedas and Ayurvedic Samhitas, regarding its clinical features and the kind of patients who might respond to certain treatment. Neither notification nor health statistics existed at that time to throw light on its rise and fall in the country. In fact, quantified information regarding its prevalence, incidence or mortality rates became available in the world only within the last hundred years. Unlike western countries, where a
slightly more efficient notification system has existed, in India, but for a few properly conducted epidemiology surveys, information regarding its distribution is neither very accurate nor reliable. Over the last 50 years, in different parts of India, several surveys have been conducted to understand the problems of tuberculosis, in the community, in terms of prevalence and incidence rates of infection and disease and mortality rates. One of earliest reports in India is the 1946 Bhore Commission report, and the impression given at that time was that tuberculosis was mainly an urban problem. Females and the young were found to be more prone to it than others. Since 1950, some well conducted surveys in general population both rural and urban were undertaken by Frimodt Moller (1949,1950-55); ICMR (1955-58); NTI (1961-68); New Delhi T.B. Centre (1962-76, reproduced from Satya Sri,1998 and as part of Tuberculosis Prevention Trial(1968-80). These studies have given a reasonable insight into the epidemiological situation of tuberculosis in our country. According to Dr.Nagpaul, there are reasons to believe that India has had more than one epidemic of tuberculosis since the time of immemorial. The present epidemic might have started in the 17th century. There is also evidence that the present epidemic has been declining since the turn of the century. The natural decline at present is very slow, probably because of prevailing poverty, malnutrition and overcrowding (Satya Sri, 1998). Until the last part of the twentieth century, tuberculosis (TB) was a major cause of death in both developed and developing countries. Due to a range of factors such as the human immunodeficiency virus (HIV) epidemic, population growth, migration, socioeconomic changes, and broad spread of aggressive and resistant new strains such as the Beijing and W strains, a resurgence of TB has occurred, even in low endemic
areas (Dolin PJ, et al., 1994). In 1993, the World Health Organization (WHO) declared a state of global emergency for TB due to the steady worldwide increase in the disease. Along with HIV and malaria, TB has been declared a global enemy. In 2007; an estimated 13.7 million people were living with (active) TB, including 9.3 million new cases. There were an estimated 1.8 million TB deaths in 2007, one in four of which was HIV-related, twice as many as previously recognized. Twenty-two countries are considered “high-burden countries (HBCs),” which account for approximately 80% of new TB cases each year; most HBCs are in Africa and Asia. India, China, Indonesia, South Africa, and Nigeria have the highest number of new TB cases in the world. The TB incidence rate (139 per 100,000 populations) appears to have peaked in 2004, but is declining at a rate less than 1% per year. Incidence is declining in all regions except Europe. TB prevalence (206 per 100,000) and death rates (27 per 100,000) are declining globally and in all six WHO regions. The global case detection rate under DOTS programs in 2007 was 63%, short of the global target of 70%. The treatment success rate reached the global target of 85% in 2006. If current trends remain, the internationally-agreed upon targets of the UN Millennium Development Goals (MDGs), to halt and reverse the incidence of TB by 2015, appear to be within reach. The additional MDG targets—halving TB prevalence and death rates by 2015—may be within reach in some regions, although not in Africa or Europe (WHO, 2009). TB and HIV are frequently referred to as co- or dual-epidemics due to their high rate of co-infection. The HIV epidemic has been largely responsible for the resurgence of TB starting in the 1980s, as HIV weakens the immune system, increasing the likelihood that an individual will become infected and develops active
TB. Additionally, TB is harder to diagnose and progresses more rapidly in someone with HIV. As a result, TB is a leading cause of death among people with HIV, especially in developing countries. An estimated 1.4 million of the 9.3 million new TB cases were also HIV positive in 2007. The co-infections in Africa, the region hardest hit by HIV were 79%. South Africa alone accounted for 31% of the total number of HIV-positive TB cases in the Africa region. Of the 1.8 million people who died from TB in 2007, an estimated 4,56,000 were HIV positive (WHO, 2005). The highest numbers of MDR-TB were found in India, China and the Russian Federation. In some areas of the former Soviet Union, more than 15% of new cases were MDR-TB (WHO, 2008). An HIV positive person infected with M.tuberculosis has a 50% lifetime risk of developing TB whereas an HIV negative person infected with M.tuberculosis has only 10% risk of developing TB. In India, about 50-60% of HIV positive patients will develop TB in their lifetime ( RNTCP, TB-HIV A guide for Health Worker).

1.3 PHYSIQUE AND BODY COMPOSITION RESEARCH

On the basis of an observational study Padmapriyadarsini et al. (2009) found that, morphologic and body composition changes are different in men and women on generic combination antiretroviral therapy. He observed that out of the 34 patients on combination antiretroviral therapy, 5 males and 12 females had noticeable changes in their body shape. Significant decrease in triceps skin fold thickness, an increase in waist circumference and waist: hip ratio was observed in females. Bioelectric impedance analysis did not show any changes in total body fat in either sex. They suggested that since the presence and severity of fat redistribution could affect adherence as well as the success of antiretroviral therapy, close monitoring is required
to detect and prevent this complication early. According to the study of Snehla et al. (2001), the severity of human immunodeficiency virus infection is associated with decreased phase angle, fat mass and body cell mass in adults with pulmonary tuberculosis infection in Uganda. They found that there were no significant differences in body mass index, body cell mass, fat mass or fat-free mass between HIV-positive and HIV-negative adults. Sharma et al. (2008) studied changes in the body composition components in the patients with pulmonary tuberculosis and observed highly significant differences in all the twelve anthropometric variables except body height. When data was further analysed between sputum negative and sputum positive patients with pulmonary tuberculosis, highly significant differences were found only in total body fat and statistically significant differences were observed in weight, chest circumference in normal position, abdominal circumference, right calf and buttock circumferences. They concluded that TB patients were more malnourished than normal people and suggested that special nutritional care should be taken for TB patients to give them a better quality of life. Tverdal (1986) studied body mass index and incidence of tuberculosis and observed that incidence of pulmonary tuberculosis decreased with increasing body mass index. The trend was roughly linear on the log scale, and was the same for both sexes and all age group. David et al. (2009) studied management of morphologic changes associated with antiretroviral use in HIV-infected patients and observed that morphological changes related to altered distribution of regional adipose tissue are well characterized as a potential complication of antiretroviral treatment regimens that can be physically disfiguring and negatively affect the quality of life. Lipoatrophy and lipo hypertrophy often occur
independently of one another, and the risk of developing these conditions has been associated with specific antiretroviral medications but can also be influenced by a number of host factors. Hanrahan et al. (2010) studied body mass index and risk of tuberculosis and death among a cohort of HIV infected adults in Soweto, South Africa and observed that incidence rates of mortality were 10.4/100 person-years for baseline BMI of 18.5 or less, 3.6/100 person-years for baseline BMI 18.6-25, 1.7/100 person-years for baseline BMI 25.1-30, and 1.6/100 person-years for baseline BMI more than 30. Compare to those with normal BMI, overweight and obese participants had a significantly reduced risk of mortality. Mulligan et al. (1997) studied cross-sectional and longitudinal evaluation of body composition in men with HIV infection and observed that weight loss in patients with baseline fat of more than 15% was only 16% lean body mass, but the composition of weight lost in men with baseline fat of less than 15% was 70% lean body mass. They concluded that progressive decrease in fat and lean tissue occurs in men with HIV infection, with the composition of weight lost depending on baseline fat content. These results argue against the widely held notion that HIV associated wasting is characterized by preservation of fat at the expense of lean tissue. Mulligan et al. (2005) studied fat distribution in HIV infected women in the United States and observed that the majority of women in both groups had body mass index in the overweight or obese categories. On the overall, both weight and body mass index in the HIV-positive women were significantly lower than in the HIV-negative women. This difference between groups in weight was explained entirely by differences in fat content. Total trunk and leg fat were all significantly lower in the HIV-positive women, but there was no difference between groups in total lean body
mass (LBM). Mary Grace Tungdim and Satwanti Kapoor (2008) studied tuberculosis treatment and nutritional status among the tribals of north east India and observed that the percentage of chronic energy deficiency based on body mass index (BMI<18.5Kg/m2) for the different groups of subjects were 64.5% before starting treatment, 49% 2 months of treatment, 34% after completion of treatment and 6.3% control group respectively. Based on the World Health Organization BMI classification, the prevalence of chronic energy deficiency (BMI<18.5 kg/m2) among tuberculosis patients in the different stages of treatment was from high to very high indicating a critical situation. Khongsidier (2001) studied body mass index of adult males in 12 populations of northeast India and observed that the variation in mean BMIs between populations was highly significant, ranging between 18.3 and 20.5 kg/m². Despite a few exceptions, the mean values of BMI in the tribal populations were significantly higher than the caste groups. The prevalence of chronic energy deficiency was also lower in the tribal (19%) than in the Hinduized (49%) and caste (52%) populations. Swaminathan et al. (2002) studied pulmonary tuberculosis in HIV positive individuals and observed that tuberculosis has a varied clinical presentation in patients with HIV infection. The most common presenting symptoms were cough and loss of weight, followed by fever. The average duration of symptoms was 12 weeks, indicating that there was a delay in diagnosing tuberculosis and starting treatment. They suggest that treatment with standard anti-tuberculosis regimens using DOTS could go a long way in improving the clinical condition and quality of life of patients with HIV and tuberculosis. However, without concomitant anti-retroviral treatment there is continued immunologic deterioration and progression of HIV disease.
1.4 STATEMENT OF OBJECTIVES:

Although a large number of studies on the physique and body composition were conducted on various population of World and a few in India, no such studies have ever been conducted on the HIV/AIDS and Pulmonary Tuberculosis patients of Manipur. So, considering the dearth of information on the physique and body composition of HIV/AIDS and Pulmonary Tuberculosis Meitei male patients of Manipur, the present work is carried out. The present work is steered by the hypothesis that,

1. There may be inter-group anthropometric and body composition variations within the Meitei males groups i.e HIV/AIDS and pulmonary tuberculosis co-infected patients, only pulmonary tuberculosis patients and healthy individuals.

2. The magnitude of severity and the frequency of recurrence of TB may be higher among the co-infected patients than the only pulmonary tuberculosis patients.

3. Signs and symptoms experienced by co-infected patients may show variations from that of only pulmonary tuberculosis patients.

The present research work therefore aims at:

1. Studying a cohort of HIV positive Meitei male patients and to determine the number of episodes of pulmonary tuberculosis within a defined time in the life of HIV positive patients.