Psychoneuroimmunology and AIDS

George Freeman Solomon, MD

Psychoneuroimmunology (PNI) is concerned with the complex bidirectional interactions between the central nervous system and the immune system. This relatively new field of study began in the 1960s with the single hypothesis that "stress can be immunosuppressive". The field reinforces the view that all disease is multifactorial in cause, onset, and course and that disease is the result of interrelationships among specific etiologic agents (such as bacteria, viruses, and carcinogens) and genetic, endocrine, emotional, and behavioral factors. In this article, AIDS and HIV infection are examined from the perspective of PNI. Clinical observations and theoretical questions are raised about the relationship of HIV related diseases to PNI.

AIDS as a Subject of PNI Research
AIDS seems an "ideal" disease to consider and to study from a PNI frame of reference for several reasons:

1. AIDS is a viral disease;
2. clinical manifestations of infection can be absent or highly varied;
3. immune function is compromised, highly aberrant, and may include autoimmune features;
4. the disease may affect the brain and produce psychiatric illness, particularly subcortical dementia; and
5. both AIDS and HIV infection can be highly "stressful."

It is only recently that the value of a psychoneuroimmunologic approach to research on AIDS has been recognized.

The study of interactions between the central nervous system and the immune system suggest several questions pertinent to HIV infection and AIDS. These questions have immediate relevance not only to researchers but also to health care providers and HIV-infected individuals seeking to improve their health.

1. Are stress and other psychosocial variables related to HIV infection following exposure? The immunosuppressive effects of semen and of exogenous opiates have been suggested as predisposing to infection in gay men and IV drug users, respectively. A compromised immune system is known to predispose to primary viral infections, particularly of the herpes group. Can stress/distress-induced immunosuppression be a predisposing factor? Two epidemiologic studies have correlated seroconversion with receptive anal intercourse and number of sexual partners. Current research should shed light on psychological as well as behavioral risk factors in seroconversion.

2. Does an "immunosuppression-prone" personality pattern predispose to the development of AIDS? Clinical research in autoimmune diseases by the author suggests that such a personality or coping pattern might predispose an individual's immune function to decline significantly following psychological stress or a physical insult, such as a viral infection. The immunosuppression-prone pattern is similar to the "Type C" coping pattern thought to be predictive of susceptibility and poor prognosis in cancer. Common to these patterns are compliance, conformity, self-sacrifice, unassertiveness, and inexpressivity of emotions, particularly anger. Other related questions follow: is a "hardy personality," characterized by features of commitment, control, and challenge, predictive of health and protective against HIV disease? Do "stress buffers", such as social support, have any protective effects? Are there psychosocial correlates of immune functions in healthy persons? Do any such variations in individuals' immune status imply differential susceptibility to AIDS or ARC?

3. Can stress activate HIV from a latent to a rapidly-replicating state? HIV can exist in a non-replicating state, and activation is related to a specific gene. Stress has been proposed as one of several possible activators. Researchers have shown that psychological stress can activate latent herpes simplex virus.

4. Are psychosocial factors related to progression of HIV disease? The question here is multi-faceted, recognizing that psychosocial factors may have different influences on different stages of HIV infection. Are these factors more influential during the asymptomatic state of infection or during the period of severe HIV infection symptoms? Reports indicate that several individuals continue to be healthy and asymptomatic even 5 to 7 years after initial exposure to HIV. Some HIV antibody-positive individuals have shown no deterioration in immune function during two years of follow-up. Several researchers believe that individual immune response is related to the person's trial number of T-helper cells and that the slope of decline in T-helper cells is predictive. Do psychosocial factors influence the overall number of T-cells, and do they affect the rate and pattern of decline?

5. Can psychosocial variables be correlated with specific alterations in immune function associated with HIV infection? A primary target of HIV is the immune system, and a variety of immunologic aberrations have been found in conjunction with HIV infection. These include not only the reduction in number of T-helper cells and changes in the helper-suppressor T-cell ratio but also evidence of B-cell dysfunction, reduction in macrophage and natural killer cell activity, and reduction of levels of... continued on page 2

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immunoregulators like interferon and interleukin-2. Could some interventions be implemented to ameliorate or to compensate for these alterations?

6) Is length of survival related to psychosocial factors? Preliminary data from the University of California San Francisco Biopsychosocial AIDS Project suggest that survival in AIDS patients with Pneumocystis carinii pneumonia is related to use of problem-solving help; whereas, survival in ARC patients is related to greater expressions of anger and less conventionality in personality styles.

7) Do psychosocial factors relate to the presence or severity of secondary disease? This question arose from the author's clinical observation while working with a patient diagnosed with lymphadenopathy. Although I hoped that psychotherapy might result in an improved immune status, the patient's helper T-cells and helper-suppressor ratio continued to fall over a period of time. However, after nine months of therapy (focusing on dysphoric affect and difficulty in expressing emotions), the patient was no longer troubled by the fevers, night sweats, and severe, recurrent bouts of genital herpes that he had previously experienced. At the same time, feelings of depression diminished, and the patient's assertiveness increased. During the next two years, the patient's helper-suppressor T-cell ratio dropped to an exceedingly low level, and he later developed an advanced non-Hodgkin's lymphoma. Although the attending physician expected the patient to live for only days or weeks more, he responded very well to chemotherapy and after nine more months there was no longer any sign of the lymphoma. During this period the patient had been working hard on a long cherished work project, and he used both alternative and experimental treatments. Later Pneumocystis pneumonia developed, but the patient rallied once again. He fought off an infection with cryptococcosis, and he continues to complete unfinished projects, to see family and friends, and—most importantly—to hope.

Why the patient continued to do relatively well with such low T-cell numbers and why he was able to respond so well to cancer chemotherapy and to overcome his bouts of opportunistic infection remains unknown. Future research may find that such persons have a genetic or biological attribute that may explain such "hardiness." Our current observations, however, support the hypothesis that the patient's superb attitude, determination, excellent social support from family and friends, and other psychosocial attributes played a significant role.

8) Can psychosocial interventions ameliorate distress associated with AIDS and result in beneficial effects on immune function, clinical status, and length of survival? Only a few studies suggest that there may be a direct enhancement of immune function by interventions such as hypnosis and relaxation in healthy individuals. Depression and anxiety in AIDS patients have been reduced as a result of group interventions that enhance active behavioral coping skills. Current research will determine whether immune and clinical status also improve as a result of these interventions.

9) Do immune-modulating agents that may have therapeutic efficacy in AIDS and ARC also have psychological and psychiatric effects? Alpha interferon, an immune modulator, can produce behavioral, cognitive, affective, and personality changes suggestive of frontal lobe effects. Depression is particularly common. Such side-effects require discontinuation of treatment with interferon in some patients.

Conclusion

Psychoneuroimmunology has emerged recently from the vision of a few isolated investigators in different parts of the world to a defined interdisciplinary field pursued by established behavioral scientists, neuroscientists, and immunologists. As a field of study looking at the complex interactions between the central nervous system and the immune system, psychoneuroimmunology can provide specific, testable hypotheses relevant to the spectrum of HIV diseases. Currently, there are many questions and few answers, but by posing these questions other researchers may choose to approach this research frontier.

The effectiveness of psychosocial interventions has not been proven in research studies, but many AIDS service organizations and other groups have found that social support services are in great demand by individuals distressed about HIV infection and AIDS. Psychosocial factors clearly seem to provide comfort and lessen stress for these individuals; it remains unknown whether these factors also improve the immune systems of people infected with HIV. AIDS, as a multifactorial disease, offers a unique opportunity to explore the relationships among psychological, immunologic, neurologic, and health outcome variables.

George Freeman Solomon, MD is a Professor of Psychiatry at UCLA and an Adjunct Professor of Psychiatry at UC San Francisco, where he has been a member of the Biopsychosocial AIDS Project since 1983. He is also Chief of the Drug Dependency Treatment Center at the VA Medical Center in Sepulveda, California. Solomon is a pioneer in the field of psychoneuroimmunology.

Diagnosis/Treatment/Prevention
A Model for AIDS Prevention
Raymond Jacobs, TRS, RDT, MA

AIDS workers and all health professionals are vital to HIV prevention. Their efforts to help sexually active people integrate risk reduction and safer sex information into their lifestyles will lessen significantly the spread of HIV infection. AIDS prevention is now recognized as an essential component of all AIDS service delivery systems. With the prospect of ever-greater demands being placed on these systems, health professionals must focus their efforts on preventing people from getting AIDS and eliminating the need for them to seek these direct services. One model for AIDS prevention that has been used by several community-based AIDS service organizations will be discussed here.

A major element of this model is the belief that people must address and change their attitudes toward sex before they will adopt new behaviors. Studies in San Francisco have shown that sharing information about AIDS transmission is not enough to change behaviors. AIDS educators ask people to let them enter into personal and emotional aspects of their characters, personalities, and thinking, areas often locked behind doors of defense. To open these doors, AIDS workers must convince individuals that AIDS poses a personal threat to their lives.

One method to help individuals acknowledge AIDS as a personal threat is to move away from the concept of risk groups and start to discuss risk behaviors. Categorizing risk by population groups only serves to disenfranchise further these groups and make the members of them feel more isolated. When this happens, federal health officials and medical authorities lose access to these individuals, making AIDS prevention much more difficult.

When AIDS educators discuss AIDS prevention in relation to sex, the first response from many listeners is usually to dwell on all the things they can no longer do. Sex educators have learned that when certain behaviors are taken away, they must be replaced by something else in return. To this end, AIDS prevention programs must first give participants the opportunity to acknowledge and mourn the loss they perceive. Of equal importance is the need to provide participants with the chance to recognize the gains that can occur with the practice of safer sex.
Participants in these kinds of AIDS prevention programs indicate that the gains are often psychological in nature. They report that safer sex is guilt-free sex because the virus is not being passed between partners. These psychological and emotional rewards become the give-backs or gains that eventually play an active part in enhancing sexual fulfillment. The belief that one can still be sexually satisfied, albeit in different ways than before, remains one of the foundations of promoting change from high- to low-risk sexual behaviors.

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Directly related to the gain and loss approach and the attainment of sexual fulfillment is the principle that an individual must remove or reduce anxiety in order to feel erotic. Anxiety, fear, and concern for personal health and safety must be taken out of sexual activity. One way to reduce the anxiety associated with sexual expression is to present safer sex information within the framework of a celebratory act and as an alternative to forced monogamy or celibacy.

Safer sex must also be presented as a choice that individuals can make to celebrate their sexuality. Educators can offer information about HIV transmission and safer sex and still allow individuals to make their own responsible choices — choices that result in feelings of empowerment and control over their own sexual activities. Educators can reinforce the conviction that sex is a very personal concern and that individuals have control over what they and their partners choose to do with each other. In this way, listeners have the opportunity to seize control of their involvement in this epidemic which is so often perceived as being out of control.

Community-based programs have been found to be effective organizations for promoting AIDS prevention education. The most useful and relevant programs have been those that are designed, developed, and implemented using the language and mores of the community to be reached. In addition, the most effective programs are often those staffed by members of the communities; for example, recovering addicts are especially adept at reaching needle-sharing IV drug users.

Trust is the basis for successful programs, and trust is most easily established through peer support and established community leadership. Educators must nurture the distinctive sensibilities of these communities and must not be threatened by their particular ways or use of language. This often means going to the places where high-risk activities can occur and speaking the language that is appropriate to discussing sex and drug use in these environments, whether it be explicit or circumlocutory.

Most often explicit pamphlets, language, and visual materials are essential to successful AIDS prevention.

In the gay community the primary educational intervention has been the group modality with openly gay role models leading the groups. Leaders in some of these groups talk about how they have changed their sexual activities and thus might be constrained by group members as potential partners not outsiders. Sometimes group members are led through guided fantasies about sex to help them identify and explore the blocks they may have toward safer sex.

AIDS and its prevention must remain a public problem of society, not the individual, private, and psychological issue of those at risk. AIDS educators and service providers can help the public understand that AIDS is now a part of each person's life and that sex can be the way to prevent AIDS not the way to spread it.

Raymond Jacobs, TRS, RDT, MA is the Coordinator of AIDS Prevention Programs at Gay Men's Health Crisis in New York City. Jacobs presented this information at the Second National Conference on AIDS in Sydney, Australia in October 1986. John Flinn of New York assisted with the preparation of this article.

BRIEFS

In Review


Often it seems that there has been little to be optimistic about in this ongoing AIDS crisis. It is welcome news to see a volume on AIDS that is well-written and to be reminded that there are many dedicated, sensitive and highly skilled individuals doing battle in this war against AIDS.

What To Do About AIDS is a compilation of articles derived from a conference on AIDS convened by the AIDS Clinical Research Center at the University of California San Francisco in September of 1985. The contributors to this volume are clinicians from various disciplines, many of whom are nationally recognized experts in AIDS research, treatment and public policy issues. The twenty-eight authors succeed in twenty short chapters to discuss an entire range of medical and mental health related issues. The book is divided into four sections: medical issues, mental health issues, the impact of AIDS on specific subgroups, and public health/administrative issues.

The portion of the book devoted to medical issues covers topics ranging from basic definitions of AIDS and ARC to diagnostic and treatment issues of neuropsychiatric syndromes. The medical treatment of AIDS and ARC is largely omitted, but the treatment of psychiatric syndromes is discussed. What is particularly noteworthy is the authors' attention to the broad treatment needs of patients. Too often treatment discussions in medicine consist of which drug to give the patient and ignore the need to address the patient's everyday environment. Practical suggestions, e.g., placing a sign above the stove which says "Turn off" for the individual with memory impairment, are offered as a part of the comprehensive treatment of AIDS.

Psychological issues associated with AIDS are clearly presented from a number of angles. The reactions to a diagnosis of AIDS/ARC are covered as well as ways of helping individuals to cope. Data are presented that emphasize that physically healthy individuals can also be profoundly psychologically affected by dealing with the AIDS crisis. There is a particularly compassionate and sensitive chapter on the psychology of treating the terminally ill. The author offers practical and thoughtful advice on assisting the dying patient. He points out issues that we may overlook in ourselves. For example, care-givers may be excited and quick to give good news; but, sometimes to the patient's detriment, they may procrastinate with bad news. The author pays attention to details that some may ignore: what does the individual's room look like? How do the attendants dress? How do the patients feel? And not unexpectedly the author pays attention to the needs of the care-giver. The ability to see and attend to the spectrum of needs of the patient, family, and care-giver is the unique and welcome aspect of this entire volume.

A chapter on counseling of HIV seropositive individuals is valuable, particularly because it points out the complexities of antibody testing when it is properly performed. After reading this it should be much easier for those who advocate mandatory or widespread testing to understand the complicated issues which antibody testing raises.

A personalized account of the AIDS experience by a person with AIDS helps to integrate the clinical material into the real life everyday world of the person with AIDS. Other important chapters address issues of women and AIDS and substance abuse as a cofactor for AIDS. Final chapters discuss the range of clinical services and programs in San Francisco and delve into struggles over public funding including the California Governor's veto of mental health funds for AIDS in 1985.

Overall there are relatively few negative points. The brevity of presentations is one of the weaknesses. More clinical case material would be welcome. While some authors make the point
that AIDS is not a gay disease, the focus of this volume is still on AIDS as it affects gay men. With the exception of a chapter on women’s issues, other minority, racial, or ethnic group issues are essentially ignored as are spiritual issues.

Given these limitations, this volume remains a valuable contribution to understanding the mental health aspects of AIDS. It displays an awareness of the need for an empathetic, informed, comprehensive approach to caring for all individuals whose lives are affected by AIDS, an approach which is often not evident in discussions of AIDS in our society today.

—James Krajewski, M.D.

Recent Reports

Study finds Ribavirin Antagonizes Effect of AZT. Researchers believe that control of HIV infections in patients for extended periods may require a combination of antiviral agents. For example, preliminary studies of azydothyridine (AZT, now known by its brand name Retrovir) respond synergistically with acyclovir and with recombinant interferon-a to inhibit HIV duplication in vitro. However, researchers from the Harvard Medical School and Wellcome Research Laboratories found that the combination of AZT and ribavirin, another antiviral agent that inhibits HIV, had an antagonistic effect. In a report published in Science (March 13, 1987), the scientists noted that in six separate experiments under different conditions ribavirin appeared to block the inhibiting mechanisms of AZT. They cautioned that clinical trials of AZT and ribavirin in combination should be conducted only under carefully controlled conditions. Although the release of AZT is strictly controlled, many individuals have obtained ribavirin from sources outside of the United States. These individuals should be advised against self-administration of ribavirin with AZT or other antiviral agents.

Evaluation of Safe Sex Educational Interventions. In a six-month study of 800 gay and bisexual men in New York City, AIDS educators tested hypotheses about which educational interventions are most effective in helping participants lower their risk of exposure to HIV. Researchers with the Gay Men’s Health Crisis (GMHC), the nation’s oldest community-based AIDS organization, conducted their “800 Men” study to determine the effectiveness of (a) group interaction as compared to simple distribution of risk reduction information, (b) emphasizing and eroticizing safer sexual activities, and (c) erotic visuals compared to written materials and standard, medical presentations.

The study participants were assigned to different groups: (a) those who received risk reduction information individually and did not join group interventions, (b) those who discussed safer sex in a group setting, (c) men who viewed an erotic safer sex video, (d) men who were given written, not visual, erotic safer sex materials, and (e) men who participated in a basic AIDS 101 workshop with a medical authority.

Analysis of sexual activities reported by the study participants during pre- and post-test questionnaires revealed significant changes among the different groups of men. The researchers found that group interactions were more effective than individual interventions, that erotic materials were more powerful than non-erotic information, and that use of erotic visuals resulted in significant changes among the participants.

More specifically the GMHC study found that a combination of two interventions was particularly effective. The standard medical AIDS presentation — leading to varying degrees of anxiety — was most powerful in getting participants to reduce risky behavior, and the use of erotic visual materials — presented in a spirit of positive affirmation — was most effective in encouraging participants to increase safer sex activities.

The men in the study were well-educated with a mean age of 35. Of the 800 participants 13% were in monogamous relationships, 24% were in primary relationships that allowed incidental affairs, and 51% were not in relationships. During the year prior to the study, the number of men who had adopted celibacy increased from 20% to 30%. The researchers determined that 50% of the men had already adopted low-risk behavior changes prior to the study.

William D. Shattil, ACSW, Michael C. Quadland, PhD, Raymond Jacobs, TRS, RDT, MA, Richard Schuman, PhD, and James D. Eramo, PhD conducted the study for GMHC. The study results were presented at the National Lesbian and Gay Health Conference and Fifth National AIDS Forum held in Los Angeles in March. GMHC can be contacted at Box 274, 132 West 24th Street, New York, NY 10011.

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Next Month

Since the beginning of the AIDS epidemic, researchers have considered carefully the possible risks of HIV exposure to health care providers who work with AIDS patients. In addition, health care professionals have discussed among themselves their fears and anxieties resulting from close contact with a new disease and with patients from different backgrounds and lifestyles. Many health care providers have worked with AIDS patients for several years. Few studies have determined whether health care professionals’ anxieties about AIDS and their attitudes about homosexuality and drug use have changed during this period.

In the June issue of FOCUS, Molly Cooke, MD, Assistant Clinical Professor of Medicine at the University of California San Francisco and San Francisco General Hospital, will report on one such study of attitude changes over time among health care professionals who work with AIDS patients. Cooke herself treats a number of AIDS patients, and she frequently addresses the ethical dilemmas that occur for physicians working with AIDS patients.

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