

## **FACTORS KNOWN TO CAUSE FALSE POSITIVE HIV ANTIBODY TEST RESULTS**

(From Continuum Magazine Vol 4 No 3 compiled by Christine Johnson)

Anti-carbohydrate antibodies 52,19,13

Naturally-occurring antibodies 5,19

Passive immunization: receipt of gamma globulin or immune globulin (as prophylaxis against infection which contains antibodies)18, 26, 60,4, 22, 42, 43,13

Leprosy 2, 25 Tuberculosis25

Mycobacterium avium 25

Systemic lupus erythematosus 15, 23

Renal (kidney) failure 48, 23,13

Hemodialysis/renal failure 56,16, 41,10, 49

Alpha interferon therapy in hemodialysis patients 54

Flu 36

Flu vaccination 30,11, 3, 20,13, 43

Herpes simplex I 27

Herpes simplex II 11

Upper respiratory tract infection (cold or flu) 11

Recent viral infection or exposure to viral vaccines 11

Pregnancy in multiparous women 58, 53,13, 43, 36

Malaria 6, 12

High levels of circulating immune complexes 6, 33

Hypergammaglobulinemia (high levels of antibodies)4 0, 33

False positives on other tests, including RPR (rapid plasma reagent) test for syphilis 17, 48, 33,10, 49

Rheumatoid arthritis 36

Hepatitis B vaccination 28, 21, 40, 43

Tetanus vaccination 40

Organ transplantation 1, 36

Renal transplantation 35, 9, 48,13, 56

Anti-lymphocyte antibodies 56, 31

Anti-collagen antibodies (found in gay men, haemophiliacs, Africans of both sexes and people with leprosy) 31

Serum-positive for rheumatoid factor, antinuclear antibody (both found in rheumatoid arthritis and other autoantibodies) 14, 62, 53

Autoimmune diseases 44, 29, 10, 40, 49, 43: Systemic lupus, erythematosus, scleroderma, connective tissue disease, dermatomyositis

Acute viral infections, DNA viral infections 59, 48, 43, 53, 40, 13

Malignant neoplasms (cancers) 40

Alcoholic hepatitis/alcoholic liver disease 32, 48, 40,10,13, 49, 43, 53

Primary sclerosing cholangitis 48,53

Hepatitis 54

"Sticky" blood (in Africans) 38, 34, 40

Antibodies with a high affinity for polystyrene (used in the test kits) 62, 40, 3

Blood transfusions, multiple blood transfusions 63, 36,13, 49, 43, 41

Multiple myeloma 10, 43, 53

HLA antibodies (to Class I and II leukocyte antigens) 7, 46, 63, 48, 10, 13, 49, 43, 53

Anti-smooth muscle antibody 48

Anti-parietal cell antibody 48

Anti-hepatitis A IgM (antibody) 48

Anti-Hbc IgM 48

Administration of human immunoglobulin preparations pooled before 198510 Haemophilia 10, 49

Haematologic malignant disorders/lymphoma 43, 53, 9, 48, 13

Primary biliary cirrhosis 43, 53, 13, 48

Stevens-Johnson syndrome 9, 48, 13

Q-fever with associated hepatitis 61

Heat-treated specimens 51, 57, 24, 49, 48

Lipemic serum (blood with high levels of fat or lipids) 49

Haemolyzed serum (blood where haemoglobin is separated from the red cells) 49

Hyperbilirubinemia 10, 13

Globulins produced during polyclonal gammopathies (which are seen in AIDS risk groups) 10, 13, 48

Healthy individuals as a result of poorly-understood cross-reactions 10

Normal human ribonucleoproteins 48,13

Other retroviruses 8, 55,14, 48,13

Anti-mitochondrial antibodies 48,13

Anti-nuclear antibodies 48,13, 53

Anti-mitosomal antibodies 34

T-cell leukocyte antigen antibodies 48,13

Proteins on the filter paper 13

Epstein-Barr virus 37

Visceral leishmaniasis 45

Receptive anal sex 39, 64

A9 Sept. 1996, Zenger's, California

## REFERENCES

1. Agbalika F, Ferchal F, Garnier J-P, et al. 1992. False-positive antigens related to emergence of a 25-30 kD protein detected in organ recipients. *AIDS*. 6:959-962.
2. Andrade V, Avelleira JC, Marques A, et al. 1991. Leprosy as a cause of false-positive results in serological assays for the detection of antibodies to HIV-1. *Intl. J. Leprosy*. 59:125.
3. Arnold NL, Slade RA, Jones MM, et al. 1994. Donor follow up of influenza vaccine-related multiple viral enzyme immunoassay reactivity. *Vox Sanguinis*. 67:191.
4. Ascher D, Roberts C. 1993. Determination of the etiology of seroreversals in HIV testing by antibody fingerprinting. *AIDS*. 6:241.
5. Barbacid M, Bolgnesi D, Aaronson S. 1980. Humans have antibodies capable of recognizing oncoviral glycoproteins: Demonstration that these antibodies are formed in response to cellular modification of glycoproteins rather than as consequence of exposure to virus. *Proc. Natl. Acad. Sci*. 77:1617-1621.
6. Biggar R, Melbye M, Sarin P, et al. 1985. ELISA HTLV retrovirus antibody reactivity associated with malaria and immune complexes in healthy Africans. *Lancet*. ii:520-543.
7. Blanton M, Balakrishnan K, Dumaswala U, et al. 1987. HLA antibodies in blood donors with reactive screening tests for antibody to the immunodeficiency virus. *Transfusion*. 27(1):118.
8. Blomberg J, Vincic E, Jonsson C, et al. 1990. Identification of regions of HIV-1 p24 reactive with sera which give "indeterminate" results in electrophoretic immunoblots with the help of long synthetic peptides. *AIDS Res. Hum. Retro*. 6:1363.
9. Burkhardt U, Mertens T, Eggers H. 1987. Comparison of two commercially available anti-HIV ELISA's: Abbott HTLV-III ELA and DuPont HTLV-III ELISA. *J. Med. Vir*. 23:217.
10. Bylund D, Ziegner U, Hooper D. 1992 Review of testing for human immunodeficiency virus. *Clin. Lab. Med*. 12:305-333.
11. Challakere K, Rapaport M. 1993. False-positive human immunodeficiency virus type 1 ELISA results in low-risk subjects. *West. J. Med*. 159(2):214-215.
12. Charmot G, Simon F. 1990. HIV infection and malaria. *Revue du praticien*. 40:2141.
13. Cordes R, Ryan M. 1995. Pitfalls in HIV testing. *Postgraduate Medicine*. 98:177.
14. Dock N, Lamberson H, O'Brien T, et al. 1988. Evaluation of atypical human immunodeficiency virus immunoblot reactivity in blood donors. *Transfusion*. 28:142.
15. Esteva M, Blasini A, Ogly D, et al. 1992. False positive results for antibody to HIV in two men with systemic lupus erythematosus. *Ann. Rheum. Dis*. 51:1071-1073.
16. Fassbinder W, Kuhni P, Neumayer H. et al. 1986. Prevalence of antibodies against LAV/HTLV-III [HIV] in

- patients with terminal renal insufficiency treated with hemodialysis and following renal transplantation. *Deutsche Medizinische Wochenschrift*. 111:1087.
17. Fleming D, Cochi S, Steece R. et al. 1987. Acquired immunodeficiency syndrome in low-incidence areas. *JAMA*. 258(6):785.
  18. Gill MJ, Rachlis A, Anand C. 1991. Five cases of erroneously diagnosed HIV infection. *Can. Med. Asso. J*. 145(12):1593.
  19. Healey D, Bolton W. 1993. Apparent HIV-1 glycoprotein reactivity on Western blot in uninfected blood donors. *AIDS*. 7:655-658.
  20. Hisa J. 1993. False-positive ELISA for human immunodeficiency virus after influenza vaccination. *JID*. 167:989.
  21. Isaacman S. 1989. Positive HIV antibody test results after treatment with hepatitis B immune globulin. *JAMA*. 262:209.
  22. Jackson G, Rubenis M, Knigge M, et al. 1988. Passive immunoneutralisation of human immunodeficiency virus in patients with advanced AIDS. *Lancet*, Sept. 17:647.
  23. Jindal R, Solomon M, Burrows L. 1993. False positive tests for HIV in a woman with lupus and renal failure. *NEJM*. 328:1281-1282.
  24. Jungkind D, DiRenzo S, Young S. 1986. Effect of using heat-inactivated serum with the Abbott human T-cell lymphotropic virus type III [HIV] antibody test. *J. Clin. Micro*. 23:381.
  25. Kashala O, Marlink R, Ilunga M. et al. 1994. Infection with human immunodeficiency virus type 1 (HIV-1) and human T-cell lymphotropic viruses among leprosy patients and contacts: correlation between HIV-1 cross-reactivity and antibodies to lipoarabionomanna. *J. Infect. Dis*. 169:296-304.
  26. Lai-Goldman M, McBride J, Howanitz P, et al. 1987. Presence of HTLV-III [HIV] antibodies in immune serum globulin preparations. *Am. J. Clin. Path*. 87:635.
  27. Langedijk J, Vos W, Doornum G, et al. 1992. Identification of cross-reactive epitopes recognized by HIV-1 false-positive sera. *AIDS*. 6:1547-1548.
  28. Lee D, Eby W, Molinaro G. 1992. HIV false positivity after hepatitis B vaccination. *Lancet*. 339:1060.
  29. Leo-Amador G, Ramirez-Rodriguez J, Galvan-Villegas F, et al. 1990. Antibodies against human immunodeficiency virus in generalized lupus erythematosus. *Salud Publica de Mexico*. 32:15.
  30. Mackenzie W, Davis J, Peterson D. et al. 1992. Multiple false-positive serologic tests for HIV, HTLV-1 and hepatitis C following influenza vaccination, 1991. *JAMA*. 268:1015-1017.
  31. Mathe G. 1992. Is the AIDS virus responsible for the disease? *Biomed & Pharmacother*. 46:1-2.
  32. Mendenhall C, Roselle G, Grossman C, et al. 1986. False-positive tests for HTLV-III [HIV] antibodies in alcoholic patients with hepatitis. *NEJM*. 314:921.
  33. Moore J, Cone E, Alexander S. 1986. HTLV-III [HIV] seropositivity in 1971-1972 parenteral drug abusers - a case of false-positives or evidence of viral exposure? *NEJM*. 314:1387-1388.
  34. Mortimer P, Mortimer J, Parry J. 1985. Which anti-HTLV-III/LAV [HIV] assays for screening and confirmatory testing? *Lancet*. Oct. 19, p873.
  35. Neale T, Dagger J, Fong R, et al. 1985. False-positive anti-HTLV-III [HIV] serology. *New Zealand Med. J*. October 23.
  36. Ng V. 1991. Serological diagnosis with recombinant peptides/proteins. *Clin. Chem*. 37:1667-1668.
  37. Ozanne G, Fauvel M. 1988. Performance and reliability of five commercial enzyme-linked immunosorbent assay kits in screening for anti-human immunodeficiency virus antibody in high-risk subjects. *J. Clin. Micro*. 26:1496.

38. Papadopulos-Eleopulos E. 1988. Reappraisal of AIDS - Is the oxidation induced by the risk factors the primary cause? *Med. Hypo.* 25:151.
39. Papadopulos-Eleopulos E, Turner V, and Papadimitriou J. 1993. Is a positive Western blot proof of HIV infection? *Bio/Technology.* June 11:696-707.
40. Pearlman ES, Ballas SK. 1994. False-positive human immunodeficiency virus screening test related to rabies vaccination. *Arch. Pathol. Lab. Med.* 118:805.
41. Peternan T, Lang G, Mikos N, et al. Hemodialysis/renal failure. 1986. *JAMA.* 255:2324.
42. Piszkevicz D. 1987. HTLV-III [HIV] antibodies after immune globulin. *JAMA.* 257:316.
43. Profitt MR, Yen-Lieberman B. 1993. Laboratory diagnosis of human immunodeficiency virus infection. *Inf. Dis. Clin. North Am.* 7:203.
44. Ranki A, Kurki P, Reipponen S, et al. 1992. Antibodies to retroviral proteins in autoimmune connective tissue disease. *Arthritis and Rheumatism.* 35:1483.
45. Ribeiro T, Brites C, Moreira E, et al. 1993. Serologic validation of HIV infection in a tropical area. *JAIDS.* 6:319.
46. Sayers M, Beatty P, Hansen J. 1986. HLA antibodies as a cause of false-positive reactions in screening enzyme immunoassays for antibodies to human T-lymphotropic virus type III [HIV]. *Transfusion.* 26(1):114.
47. Sayre KR, Dodd RY, Tegtmeier G, et al. 1996. False-positive human immunodeficiency virus type 1 Western blot tests in non-infected blood donors. *Transfusion.* 36:45.
48. Schlepner CJ. Detection of HIV-1 infection. In: (Mandell GI, Douglas RG, Bennett JE, eds.) *Principles and Practice of Infectious Diseases*, 3rd ed. New York: Churchill Livingstone, 1990:1092.
49. Schochetman G, George J. 1992. Serologic tests for the detection of human immunodeficiency virus infection. In *AIDS Testing Methodology and Management Issues*, Springer-Verlag, New York.
50. Simonsen L, Buffington J, Shapiro C, et al. 1995. Multiple false reactions in viral antibody screening assays after influenza vaccination. *Am. J. Epidem.* 141:1089.
51. Smith D, Dewhurst S, Shepherd S, et al. 1987. False-positive enzyme-linked immunosorbent assay reactions for antibody to human immunodeficiency virus in a population of midwestern patients with congenital bleeding disorders. *Transfusion.* 127:112.
52. Snyder H, Fleissner E. 1980. Specificity of human antibodies to oncovirus glycoproteins; Recognition of antigen by natural antibodies directed against carbohydrate structures. *Proc. Natl. Acad. Sci.* 77:1622-1626.
53. Steckelberg JM, Cockerill F. 1988. Serologic testing for human immunodeficiency virus antibodies. *Mayo Clin. Proc.* 63:373.
54. Sungar C, Akpolat T, Ozkuyumcu C, et al. Alpha interferon therapy in hemodialysis patients. *Nephron.* 67:251.
55. Tribe D, Reed D, Lindell P, et al. 1988. Antibodies reactive with human immunodeficiency virus gag-coated antigens (gag reactive only) are a major cause of enzyme-linked immunosorbent assay reactivity in a blood donor population. *J. Clin. Micro.* April:641.
56. Ujhelyi E, Fust G, Illei G, et al. 1989. Different types of false positive anti-HIV reactions in patients on hemodialysis. *Immun. Let.* 22:35-40.
57. Van Beers D, Duys M, Maes M, et al. Heat inactivation of serum may interfere with tests for antibodies to LAV/HTLV-III [HIV]. *J. Vir. Meth.* 12:329.
58. Voevodin A. 1992. HIV screening in Russia. *Lancet.* 339:1548.
59. Weber B, Moshtaghi-Borojeni M, Brunner M, et al. 1995. Evaluation of the reliability of six current anti-HIV-1/HIV-2 enzyme immunoassays. *J. Vir. Meth.* 55:97.

60. Wood C, Williams A, McNamara J, et al. 1986. Antibody against the human immunodeficiency virus in commercial intravenous gammaglobulin preparations. *Ann. Int. Med.* 105:536.
61. Yale S, Degroen P, Tooson J, et al. 1994. Unusual aspects of acute Q fever-associated hepatitis. *Mayo Clin. Proc.* 69:769.
62. Yoshida T, Matsui T, Kobayashi M, et al. 1987. Evaluation of passive particle agglutination test for antibody to human immunodeficiency virus. *J. Clin. Micro.* Aug:1433.
63. Yu S, Fong C, Landry M, et al. 1989. A false positive HIV antibody reaction due to transfusion-induced HLA-DR4 sensitization. *NEJM.*320:1495.
64. National Institute of Justice, *AIDS Bulletin.* Oct. 1988.