Texas Preventable Disease NEWS

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contents:

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THE SIGNIFICANCE AND ACCURACY OF ELISA TESTS FOR HIV ANTIBODIES*

SIGNIFICANCE

It has been said that human immunodeficiency virus (HIV) antibody tests have no significance because they are not diagnostic for AIDS. While it is true that a positive antibody test result cannot by itself be used to make a diagnosis of AIDS, it is inaccurate to say that a positive or negative antibody test is of no significance. A positive antibody test means that the person has produced antibody against HIV — the AIDS virus — and this occurs only if the person was both exposed to and infected by HIV. All future cases of AIDS-related-conditions (ARC) and AIDS will come from HIV infected persons. Current estimates are that from 25% to 50% of HIV infected persons will develop AIDS within five to ten years after their initial infection. Furthermore, laboratory studies have shown that the majority of HIV antibody positive persons, regardless of whether they have signs or symptoms, have HIV circulating in their blood; thus, they should be considered potentially infectious to others through sexual contact or by exchange of blood.

ACCURACY OF THE HIV ANTIBODY TESTS

Commercially available ELISA tests for HIV antibody are extremely accurate in detecting the presence of HIV antibody (test sensitivity) and in identifying the absence of antibody (test specificity). Doubts about the accuracy of the tests arise when they are used in populations where the prevalence of infection is extremely low or absent. In situations such as routine screening of blood donors who are not at any risk of HIV infection, the predictive value of a positive test is very low. The positive predictive value is defined as the likelihood that a positive test result represents a true positive (ie, a person who has HIV antibodies and is infected). Calculation of the predictive value of a positive test result for two different populations — one with a very low prevalence of infection and one with a high prevalence of infection — will illustrate this point. Calculations are based on the assumption that the sensitivity and specificity of the tests are 99%. In actual fact, the commercially available tests have an accuracy of better than 99%.

A. The predictive value of a positive test result in 1,000 blood donors where the infection rate is one per thousand.

1. Since the test is 99% sensitive, it will identify the one person with HIV antibody.
2. Since the test is 99% specific, it will correctly identify 99% of the 999 persons without antibodies (989 persons), but will incorrectly identify 1% (10 persons) as having antibodies when they don't (ie, false positives).
3. Thus, there will be a total of 11 positive test results, one true positive and 10 false positives.
4. The predictive value of a positive test in this situation is one out of 11 or less than 10%.**

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* Reprinted from: California Morbidity, #44, November 7, 1986.

** The use of supplemental tests such as the Western blot or the indirect fluorescent antibody (IFA) test will correctly identify virtually all of the false positive ELISA tests.

B. The predictive value of a positive test result in 1,000 gay men in San Francisco where the infection rate is 50%.

1. Since the test is 99% sensitive, it will identify 495 of the 500 men with HIV antibodies.

2. Since the test is 99% specific, it will correctly identify 495 of the 500 gay men without HIV antibody, but will incorrectly identify 1% (five men) as having antibodies when they don't (ie, false positives).

3. Thus, there will be a total of 500 positive test results: 495 true positives and five false positives.

4. The predictive value of a positive test in this situation is 495 out of 500, or 99%.

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CHLOROQUINE-RESISTANT PLASMODIUM FALCIPARUM MALARIA IN WEST AFRICA*

On May 27, 1986, a 50-year-old American helicopter mechanic traveled to Enugu, a city in the eastern state of Anambra, Nigeria. While in Nigeria, he took chloroquine 300 mg base weekly for malaria chemoprophylaxis and continued this regimen after returning to the United States via Lagos on December 6. He traveled only in eastern Nigeria and did not travel to other malarious countries. On December 9, he developed fever, chills, and headache, and was hospitalized in California on December 18.

On December 20, a peripheral blood smear revealed that 0.5% of red blood cells were infected with asexual *Plasmodium falciparum* parasites, and treatment with chloroquine 1,500 mg base was administered over a 3-day period. He became afebrile on December 22, and a peripheral blood smear on December 23 showed rare trophozoites. On December 27, he again became febrile, and a blood smear on December 31 revealed a parasitemia of 1.0%. A whole-blood specimen collected on December 31 was analyzed by high performance liquid chromatography and contained 151 ng of chloroquine/ml, indicating that the treatment dosage of chloroquine had been adequately absorbed.

A parasite isolate collected on December 31 was assayed by the 48-hour in vitro test of Nguyen-Dinh and Trager and found to be resistant to chloroquine: parasite multiplication was inhibited only at 0.3 mol of chloroquine/liter of medium, a concentration higher than the accepted limit of in vitro chloroquine resistance (0.06 mol/L). The patient responded promptly to treatment with quinine (650 mg three times daily for 3 days) and tetracycline (250 mg four times daily for 7 days) and has remained well.

MMWR Editorial Note: Chloroquine-resistant *P. falciparum* was first confirmed in Africa in 1979 when a *P. falciparum* infection in a traveler returning from Tanzania was not cured by a standard treatment regimen of chloroquine, and the infecting parasite was found to be resistant to chloroquine in vitro. Subsequently, chloroquine-resistant *P. falciparum* has spread throughout East and Central Africa and, in 1985, was reported from as far west as Cameroon. A recent report from Benin and the case from Nigeria presented here indicate that chloroquine-resistant *P. falciparum* is now present in West Africa as well.

These reports of chloroquine-resistant *P. falciparum* malaria have serious public health implications since malaria transmission in much of West Africa is intense and perennial. In Nigeria, the most populous nation on the African continent, a change in the efficacy of chloroquine, the most widely used anti-malarial drug, could affect many of the country's estimated 80 to 100 million residents. Since chloroquine-resistance can extend rapidly after it is first observed in a geographic region, the efficacy of chloroquine will need to be systematically monitored by health care personnel throughout West Africa.

In accordance with Centers for Disease Control (CDC) recommendations for short-term travelers to chloroquine-resistant areas, travelers to Nigeria and Benin should take weekly chloroquine prophylaxis and should also carry pyrimethamine/sulfadoxine (Fansidar) to be taken in the event of a fever or flu-like illness when medical attention is not readily available. Additionally, since *P. falciparum* infections that are chloroquine prophylaxis failures may

*Reprinted from: CDC. MMWR 1987;36:13-4.

MONTHLY SUMMARY OF REPORTABLE DISEASES IN TEXAS

Dates of Onset: March 1 to April 4, 1987

REPORTABLE DISEASE	PHR 1	PHR 2	PHR 3/12	PHR 4	PHR 5	PHR 6	PHR 7/10	PHR 8	PHR 9	PHR 11	WEEKS 9 - 13 1986	WEEKS 9 - 13 1987	CUMULATIVE 1986	CUMULATIVE 1987
AIDS	AIDS STATISTICAL FORMAT BEING REDESIGNED.													170
Amebiasis			3		1	1		1	1	2	31	9	85	36
Botulism							1			1	0	2	0	4
Brucellosis											2	0	4	2
Campylobacteriosis	2		1		5	2	2	4	1	8	34	25	89	106
Coccidioidomycosis											3	0	13	2
Dengue											0	0	0	0
Encephalitis										1	9	1	27	8
Hansen's Disease					1		1		1		8	3	11	8
H. influenzae infections	2	1	4		15	6	3	2	5	9	0	47	0	176
Hepatitis A	9		12	3	48	11	2	2	13	8	224	108	607	402
Hepatitis B	5		4		33	7	2	4	3	8	143	66	382	253
Hepatitis D											0	0	0	1
Hepatitis, NA-NB		1	1	2	6	1			2	3	23	16	43	40
Hepatitis, U			1		31	1	1	2	1	2	103	39	247	123
Histoplasmosis										1	6	1	20	7
Legionellosis											8	0	13	4
Leptospirosis											1	0	1	0
Listeria											0	0	0	3
Lyme Disease											0	0	0	1
Malaria											3	0	14	5
Measles					20			1			29	21	62	57
Meningococcal Infections				1	2	1	3		2		16	9	44	48
Meningitis, Aseptic	2	1			2	2	1		1	9	39	18	93	78
Mumps	2				8		3	4	1	8	30	26	78	97
Pertussis											9	0	21	0
Psittacosis											0	0	2	0
Relapsing Fever											0	0	0	0
Reye Syndrome											3	0	5	4
RMSF											0	0	2	0
Rubella											19	0	41	0
Salmonellosis	3	1	5	6	17	6	5	3	2	10	118	58	304	291
Shigellosis	11	3	5	4	12	1	4	7	6	6	78	59	256	192
Tetanus											0	0	0	0
Toxic Shock Syndrome					1						3	1	6	3
Trichinosis											0	0	1	0
Tularemia											1	0	1	0
Typhoid											5	0	8	2
Typhus, Endemic											2	0	7	0
Vibrio infections											0	0	0	0
Chickenpox	113	78	273	91	1,335	316	744	555	266	1,194	5,663	4,965	9,093	8,477
Influenza	451		355	670	2,629	634	560	1,690	611	1,103	23,782	8,703	43,077	34,571

NOTE: There have been no reported cases of: Anthrax, Cholera, Diphtheria, Plague, Polio, Q Fever, Rabies, or Yellow Fever

MONTHLY SUMMARY OF REPORTABLE OCCUPATIONAL DISEASES IN TEXAS
MARCH 1, THROUGH APRIL 4, 1987

REGION	1	2	3/12	4	5	6	7/10	8	9	11	WEEKS 9-13 1986	WEEKS 9-13 1987	CUMULATIVE 1986	CUMULATIVE 1987
ELEVATED BLOOD LEAD LEVELS				1	15					7	46	23	96	169
ACUTE OCCUPATIONAL PESTICIDE POISONING														
SILICOSIS														
ASBESTOSIS														

Blood lead level ≥40 ug/dl in persons 15 years of age or older; summarized by date of blood lead test.
Regular summaries of these reportable occupational diseases will be included as reporting procedures become better established.

* * *

CUMULATIVE TOTALS FOR DISEASES REPORTED TO THE BUREAU OF COMMUNICABLE DISEASE SERVICES THROUGH MARCH 1987

REGION	1	2	3/12	4	5	6	7/10	8	9	11	STATEWIDE 1986	STATEWIDE 1987
TUBERCULOSIS	3	2	15	1	73	24	28	32	39	135	339	352
P&S SYPHILIS	2	0	7	2	87	17	22	8	24	82	347	251
GONORRHEA	70	59	211	92	1240	371	304	145	202	424	4873	3118

respond poorly to full treatment dosages of chloroquine, they should be treated with antimalarial medications that are effective against chloroquine-resistant infections.

The Malaria Branch/CDC is currently assisting in the investigation of additional cases of possible chloroquine-resistant *P. falciparum* malaria acquired elsewhere in West Africa. CDC will update malaria prophylaxis recommendations as further information regarding the geographic extent of chloroquine-resistant *P. falciparum* becomes available. Physicians treating patients with *P. falciparum* infections that were acquired in West Africa and that may represent chloroquine prophylaxis or treatment failures are encouraged to report these cases promptly to their local or state health departments and to the Malaria Branch/CDC (telephone: weekdays (404) 452-4046, nights and weekends (404) 329-2888).

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NEW AIDS VIDEOTAPE AVAILABLE

The TDH film Library now has copies of the videotape entitled "Sex, Drugs & AIDS" available for loan. This videotape has received very favorable reviews by the Sex Information and Education Council of the United States (SIECUS), Family Life Educator, CDC's STD Interchange, and endorsement by Abigail Van Buren in her "Dear Abby" column as a videotape that clearly describes facts about AIDS. Targeted for adolescents and young adult audiences, this video takes a straightforward approach in educating viewers about the fact that AIDS is primarily a sexually transmitted disease but can also be spread through contaminated needle use among IV drug abusers. It explains that avoiding AIDS involves responsibility about sexual involvement, as well as the use of protective measures, such as condoms. This tape should be previewed by responsible adults before use. For further information or to borrow this videotape, contact the TDH Film Library at (512) 458-7260. This video is also available for loan through the local health departments or community clinics listed below.

Austin-Travis County Health Dept
Mathilde Hyams-Flores - (512) 469-2070

Beaumont City Health Dept
Gary Chernow - (409) 838-0855

Corpus Christi-Nueces County Health Dept
Kathy Thomas - (512) 851-2070

Dallas County Health Dept
Maureen Eason - (214) 920-7980

El Paso City-County Health Dept
Joe Dyoub - (915) 541-4511

Fort Worth City Health Dept
Diane Richey - (817) 870-7346

Ector County Health Dept (Odessa)
Tommy Langham - (915) 337-2007

Montrose Clinic (Houston)
Tom Audette - (713) 528-5535

San Antonio Metro Health Dist
John Flavin - (512) 299-8828

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