Cardiovascular Syphilis In a General Medical Clinic

By S. P. Lucia, M.D., Vernon C. Harp, Jr., M.D., and M. L. Hunt, M.P.H.

Cardiovascular involvement is one of the more important manifestations of late syphilis, producing marked physical incapacity and a high accidental mortality. Diagnosis is often difficult, which is important, because the type and amount of therapy are dependent upon the degree of cardiovascular involvement.

The study here reported was undertaken to determine the incidence of cardiovascular syphilis in an outpatient department of a general medical clinic, the types of lesions most commonly encountered, and the age groups most frequently affected.

The group studied was made up of 830 patients referred to the Luetic Cardiovascular Clinic by the Clinic of Dermatology and Syphilology, University of California Medical Center. During the 12-year period, 1939–51, 2,273 of the total of 274,782 patients seen at the medical center were referred to the Clinic of Dermatology and Syphilology because they had either a history or serologic tests indicative of syphilis. The 830 patients in this study were in turn referred to the Luetic Cardiovascular Clinic, where 354 were found to have cardiovascular syphilis and 187 were found to have other cardiovascular disease (table 1).

Most of the patients with cardiovascular syphilis (310, or 87.7 percent) were over 40 years old; 213 were in the age group 41–60; 97 were over 61; only 44 were aged 21–40 (table 2). Aneurysm was the most frequently observed lesion in the older age groups, 48.4 and 67 percent, respectively; simple aortitis was found in 47.7 percent of the younger group. It is probable that in the older age groups the syphilitic process has been present longer, thus increasing the possibility of involvement of the heart as well as other organs.

Of the 354 patients with cardiovascular syphilis, 91 (25.7 percent) had simple aortitis; 180 (50.8 percent), aneurysms; 42 (11.9 percent), aortic insufficiency; and 41 (11.6 percent), a combination of aneurysm and aortic insufficiency (table 3).

Dr. Lucia is professor of medicine and chairman of the subdepartment of preventive medicine, Dr. Harp is clinical assistant in medicine, and Miss Hunt is a graduate research immunologist at the University of California School of Medicine, San Francisco.

Diagnosis

In the Luetic Cardiovascular Clinic, the cardiovascular history, results of the physical examination, and conclusions drawn from a fluoroscopic examination, which represented an agreement between the various members of the examining staff, were recorded on a standard form. Examinations of the patients were made at intervals of 3, 6, or 12 months as the situation required. These examinations served as a check on the previous findings and also permitted detection of any progress in the disease process. From the data obtained, the diagnosis of cardiovascular disease was made;

Table 1. Incidence of cardiovascular syphilis in 2,273 patients referred to the Clinic of Dermatology and Syphilology and in 830 patients further referred to the Luetic Cardiovascular Clinic

Type of cardiovascular disease	Patients referred to Luetic Cardiovascular Clinic		Percent of 2,273 patients referred to Dermatology and Syphilology Clinic
	Number	Percent	
Total	830	100	36.5
Syphilitic cardiovascular disease	354	42.7	15.6
"Other" cardiovascular diseases [1]	187	22.5	8.3
No evidence of cardiovascular disease	289	34.8	[2]

[1] Rheumatic heart disease, 7 cases; congenital heart disease, 1 case; arteriosclerosis and hypertension.

[2] This group represents only that portion of the 830 individuals originally suspected of having involvement of the heart and therefore cannot be statistically evaluated in relation to the total 2,273 patients.

Table 2. Age distribution of 643 seropositive patients, by presence or absence of syphilitic cardiovascular disease

Diagnosis	Total	Age groups				
		Under 40	41–50	51–60	61–70	Over 70
Total	643	184	198	158	87	16
Cardiovascular syphilis	354	44	107	106	81	16
No evidence of syphilitic cardiovascular disease	289	140	91	52	6	0

opinion as to its activity, severity, and progression was given; and a plan of therapy was recommended.

Recognition of syphilis of the cardiovascular system depends upon the detection of weakness in the walls of the aorta. Chest pain, cough, dyspnea, or hoarseness, a broadened area of dullness at the base of the heart, unilateral pulse weakness, and a tambour quality of the aortic second sound all suggest syphilitic cardiovascular disease. An aortic diastolic murmur is of positive diagnostic significance since it is usually associated with a widened pulse pressure and it may be accompanied by the peripheral signs of aortic insufficiency. Although aortic insufficiency may follow advanced arteriosclerosis, the peripheral signs of aortic insufficiency, in such instances, may be minor or absent.

A fluoroscopic examination is the most reliable method of detecting cardiovascular syphilis in its early stages, and a series of fluoroscopic examinations provides the best indication of the progression and severity of the disease. The earliest positive sign of aortitis is a definite broadening of the ascending aorta. By serial examinations, progressive enlargement, sacculation, and fusiform dilatation of the aorta are revealed. Fusiform dilatations of the ascending aorta are not invariably due to syphilis, but are more frequent when this disease complicates the usual changes caused by arteriosclerosis and hypertension. Fusiform aneurysms are usually, but not necessarily, due to syphilis, while saccular aneurysms are almost always the result of syphilitic aortitis.

In our experience, calcification in the wall of the ascending aorta is most often consequent to syphilitic invasion; in the wall of the abdominal aorta it is usually the result of arteriosclerosis, and in the thoracic aorta or aortic knob it may be due to arteriosclerosis alone. Calcification occurring exclusively in the ascending aorta indicates that the sclerotic changes are more marked because of the antecedent syphilitic inflammation.

Age Groups Affected

In table 2 the age distribution of 354 individuals who were diagnosed as having cardiovascular syphilis is compared with the age distribution of 289 individuals in whom no evi-

Table 3. Incidence of syphilitic cardiovascular lesions, by age

Lesion	Total		Age (years)						
	Number	Percent	21–30	31–40	41–50	51–60	61–70	71–80	81+
Total	354	100.0	7	37	107	106	81	14	2
Simple aortitis [1]	91	25.7	5	16	40	22	7	1	0
Aneurysm	180	50.8	0	12	43	60	53	11	1
Aortic insufficiency	42	11.9	2	7	14	13	4	1	1
Aneurysm and aortic insufficiency	41	11.6	0	2	10	11	17	1	0

[1] Simple aortitis refers to a broadened aorta, usually associated with a systolic murmur and a hollow aortic second sound, and often with symptoms due to these changes. It specifically excludes patients with aneurysms or aortic valve insufficiency.

Table 4. Incidence of syphilitic cardiovascular lesions, according to character of the lesion

Lesion	Number	Age (years)					
		21–40		41–60		61–80+	
		Number	Percent	Number	Percent	Number	Percent
Total	354	44	100. 0	213	100. 0	97	100. 0
Simple aortitis	91	21	47. 7	62	29. 1	8	8. 3
Aneurysm	180	12	27. 3	103	48. 4	65	67. 0
Aortic insufficiency	42	9	20. 4	27	12. 7	6	6. 2
Aneurysm and aortic insufficiency	41	2	4. 6	21	9. 8	18	18. 5

dence of cardiovascular disease was found. The incidence of syphilitic cardiovascular lesions, by age, is shown in table 3.

Incidence of Lesions

The lesions which were considered to be the result of syphilitic invasion of the cardiovascular system were simple aortitis, aneurysms, aortic insufficiency, and aneurysms and aortic insufficiency combined.

In the group of patients with simple aortitis due to syphilis associated symptoms such as aortic systolic murmurs or a hollow quality to the aortic second sound were also present. There were no instances of aortic insufficiency, aneurysm, hypertension, or gross arteriosclerosis of the aorta in this group. Aneurysms were present in 221 (62.4 percent) of the patients, and in 41 of these the aneurysm was accompanied by aortic insufficiency. On auscultation, insufficiency of the aortic valve was revealed in 83 (23.4 percent) of the patients, and in 42 of these there was no fluoroscopic evidence of an aneurysmal dilatation of the aorta.

Types of Lesions

In table 4 the data are arranged by age groups and according to the character of the lesion. In the light of the present day concept of the pathological changes in syphilitic aortitis, the first assault on the aorta would lead to a simple inflammatory process with broadening of the aorta and advance to the production of aneurysms with or without involvement of the aortic valve itself. Accordingly, a greater incidence of simple aortitis would be expected in the young subject suffering from syphilitic cardiovascular disease and with increasing years an augmented incidence of aneurysm. A comparison of the incidence of simple aortitis in three age groups (table 4) reveals a statistically significant decrease in the occurrence of simple aortitis with advancing age and a statistically significant increase in the incidence of aneurysms. Aortic insufficiency occurred according to the statistically expected frequencies in each of the three age groups studied.

Table 5. Aneurysms of the aorta, by site of the lesion

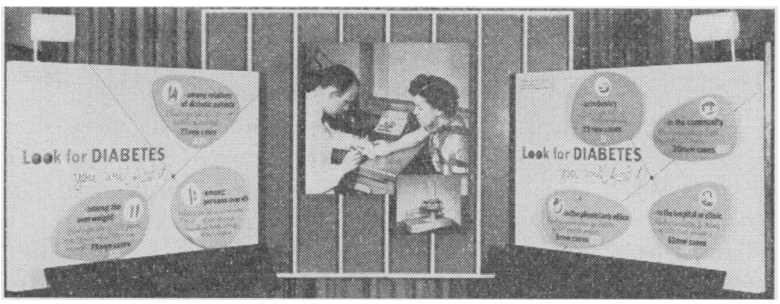
Location of aneurysm	Number	Percent
Total	254	100. 0
Ascending aorta	211	83. 1
Transverse aorta	14	5. 5
Descending aorta	29	11. 4

Of the 221 patients with aneurysms due to cardiovascular syphilis, several had more than one aneurysm—a total of 254 (table 5). Most of the aneurysms (211) were in the ascending aorta, 29 were in the descending aorta, and 14 in the transverse aorta. Of the patients who had aneurysms of the transverse or descending aorta without involvement of the ascending aorta, 4 were in the age group 41–60, and 6 were in the age group 61–81+.

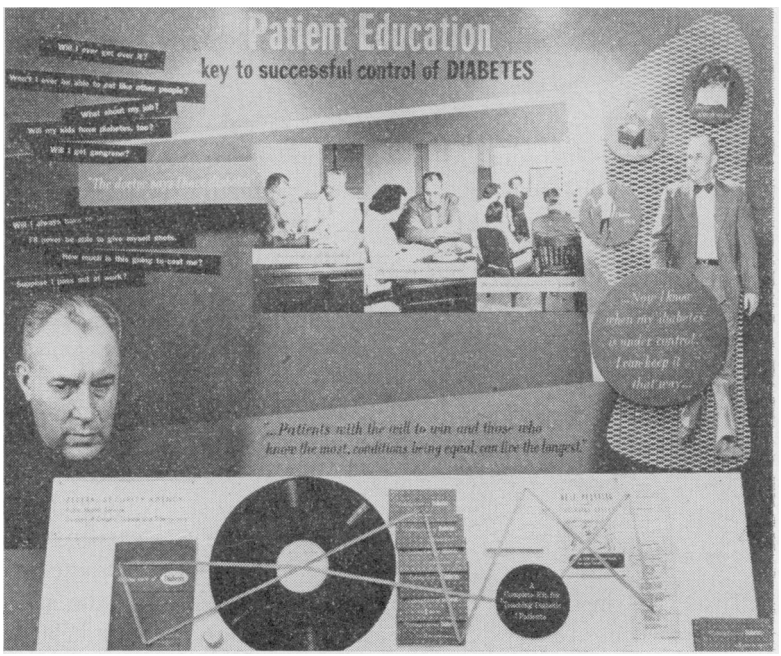
Conclusions

In the diagnosis of cardiovascular syphilis it is important (*a*) to make a systematic evaluation of the symptoms and physical signs suggestive of the disease, (*b*) to subject the patient to serial fluoroscopic examinations to determine the presence or absence of aortitis, and (*c*) if lesions are detected, to assess the rate of progression of the disease. Data obtained from such examinations are of value in deciding whether further therapy might introduce a hazard, especially in the advanced age group where hypertension, arteriosclerosis, and other evidences of degeneration of the cardiovascular system may coexist.

Diabetes Exhibits Available to Professional Groups



"Look for diabetes," is the theme of the Public Health Service exhibit (left) displayed at the 1952 annual meetings of the American Medical Association and District of Columbia Medical Society. The exhibit is 12 feet wide and 5 feet deep and weighs 250 pounds.



"Patient education, key to successful control of diabetes," (right), a Public Health Service exhibit, depicts control measures for diabetes. The lower panel displays some components of a kit of filmstrips, records, posters, and pamphlets which may be used by clinics, professional personnel, and public health workers for teaching diabetic patients. (Inquiries on how to obtain the kit separately from the exhibit should be addressed to your State health department.) The exhibit was first shown at the New England Health Institute, Storrs, Conn., and then at the annual meeting of the American Diabetic Association in Minneapolis in 1952. The exhibit is 6 feet wide and weighs 250 pounds.

Official agencies and voluntary organizations may borrow these exhibits for showings to professional audiences. The borrower, however, must pay the cost of transportation and insurance, both ways. Inquiries concerning the availability of the exhibits should be addressed to the Division of Chronic Disease and Tuberculosis, Public Health Service, Washington 25, D. C.