

1992-1. Loecker, TH, Schwartz, RS, Cotta, CW, Hickman, Jr Jr.,
**Fluoroscopic Coronary Artery Calcification and Associated
Coronary Artery Disease in Asymptomatic Young Men**, J of
the American College of Cardiology, 1992, 19:1167.
location: Radiology and Internal Medicine Branches,
Brooks AFB.
subjects: 1,466 USAF aviators
dates:
X-ray: standard fluroscopy at 80 kVp with a standard
fluoroscopic time of 1.8 minutes. The
expected radiation exposure at the skin
surface was approximately 5 RAD.
Assess: This study used a well documented in the
clinical literature research tool in an
aviator population to determine if the test
could clinically silent coronary artery
disease.
Summary: This study validated the use of this test in
the aviator population. See attached
abstract.

Fluoroscopic Coronary Artery Calcification and Associated Coronary Disease in Asymptomatic Young Men

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Little is known about the diagnostic significance of coronary artery calcification detected fluoroscopically in apparently healthy young men. This study compared the presence of fluoroscopically detected coronary artery calcification with angiographic coronary artery disease in asymptomatic male military aircrew undergoing noninvasive cardiac screening tests and coronary arteriography for occupational indications. Of 1,466 men screened with coronary fluoroscopy, 613 underwent coronary arteriography because of one or more abnormal noninvasive test results. The mean age (\pm SD) of all subjects screened was 40.2 ± 5 years (range 26 to 65).

Significant coronary artery disease ($\geq 50\%$ diameter stenosis) was found in 104 of the 613 subjects with arteriograms (16.9% disease prevalence). Overall sensitivity and specificity for coro-

nary artery calcification detection of significant disease, based only on those subjects undergoing arteriography, were 66.3% and 77.6%, respectively. For measurable disease (mild plus significant), sensitivity was 60.6% and specificity 85.9%. Positive and negative predictive values were 37.7% and 91.9%, respectively, for significant disease. For measurable disease, positive and negative predictive values were 68.9% and 80.9%, respectively.

In these asymptomatic young men, a fluoroscopic examination negative for coronary artery calcification indicated a low risk of significant coronary artery disease, whereas a positive test result (calcification present) substantially increased the likelihood of angiographically significant coronary artery disease.

(*J Am Coll Cardiol* 1992;19:1167-72)

Accurate detection of coronary artery disease in asymptomatic young men remains a significant problem in both clinical and occupational cardiology because low disease prevalence in this group significantly degrades the performance of noninvasive screening tests. However, great potential benefit exists for early disease detection in such persons because therapeutic intervention might alter the natural progression of disease. Fluoroscopic visualization of coronary calcification is an older noninvasive method shown (1-4) to have potential as a screening technique for coronary artery disease because it is anatomically based, easily performed, comparatively inexpensive and poses little risk to the patient. However, little is known about its value in detecting the asymptomatic person who may have significant coronary artery disease and may thus be at risk for myocardial ischemia, infarction or sudden death (5,6).

To better define the role of coronary fluoroscopy as a screening method for coronary artery disease in asymptomatic young men, this study reviewed the data of 613 apparently healthy male military aircrew undergoing coro-

nary artery fluoroscopy and coronary arteriography for occupational reasons.

Methods

Study patients. All U.S. Air Force aircrew members are regularly screened for health problems. Beginning at age 35 years, this examination includes a rest electrocardiogram (ECG) taken biennially to determine fitness for aviation duties. Persons with potentially significant health problems (including coronary artery disease) are referred to the U.S. Air Force School of Aerospace Medicine (USAFSAM) for extensive medical evaluation. Those <35 years of age are also referred if cardiac problems are suspected.

Most subjects (>95%) have no cardiac symptoms. All aviators with possible cardiac problems (regardless of age) who are referred to USAFSAM undergo symptom-limited treadmill exercise testing, symptom-limited exercise thallium-201 myocardial scintigraphy and coronary artery fluoroscopy except as noted later. Cardiac catheterization is mandatory for aircrew members to remain on flying status if they have 1) a coronary fluoroscopy screening test result positive for calcification; 2) one or more abnormal noninvasive tests for reversible ischemia (symptom-limited treadmill test, exercise thallium-201 scintigraphy); 3) ventricular or supraventricular tachycardia (three or more consecutive premature beats with exercise or on Holter ambulatory ECG monitoring); or 4) acquired left bundle branch block on any ECG record.

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Manuscript received July 21, 1989; revised manuscript received January 18, 1991; accepted November 13, 1991.

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