

Left anterior hemiblock in South African aircrew

E. R. SOICHER, C. W. BARLOW, D. P. MYBURGH

Serial ECGs and clinical records were examined to determine the prevalence, associated ECG abnormalities and outcome of left anterior hemiblock (LAH) in 13 037 airmen. The prevalence of LAH was 0,72% and it was not related to underlying cardiac disease. LAH should be regarded as a benign finding in healthy individuals.

S Afr Med J 1990; 78: 25.

Left anterior hemiblock (LAH) is caused by a delay or interruption of impulse conduction in the branches of the anterior fascicle of the left bundle branch.¹ It may be due to underlying heart disease or occur as an isolated ECG finding.¹ A study was undertaken to clarify its status in South African pilots attending the Institute for Aviation Medicine.

Subjects and methods

All airline, airforce and commercial pilots have regular medical examinations at the Institute for Aviation Medicine. At each visit a full history is taken and a medical examination performed. A maximal stress ECG and chest radiography are initially performed every 5 years until pilots reach the age of 40 years, then every 2 years until the age of 60 years and annually thereafter. When deemed necessary, stress ECGs are performed more frequently or cardiological investigations are performed.

The clinical records and ECGs of 13 037 pilots seen between 1964 and 1988 at the Institute for Aviation Medicine were reviewed with special reference to: (i) the ECG onset and progression of LAH; (ii) its relationship to other intraventricular conduction defects and ischaemia; and (iii) cardiac symptoms, disease and death.

Criteria for the diagnosis of LAH were:² (i) QRS duration < 0,12 s; (ii) QRS axis < -45° and > -90°; (iii) rS pattern in leads II, III and aVF; and qR pattern in lead aVL.

For all associated ECG abnormalities the World Health Organisation/International Society and Federation for Cardiology Task Force criteria were used.²

Results

Of 13 037 airmen attending the Institute for Aviation Medicine, 94 were found to have LAH (prevalence 0,72%). The subjects were divided into two groups:

Group I consisted of 35 subjects who developed LAH after entry into the study. They had been attending the Institute for Aviation Medicine for an average of 9,1 years (range 1 - 21 years) before developing LAH. The mean age at onset was 37,7 years (range 18 - 55 years). Twenty-one subjects were followed up for an average of 7,3 years (range 1 - 18 years). Eleven were followed up for less than 5 years and 3 for more than 10 years. Of the remaining 14 subjects, 12 were due for follow-up in the 3 years after the study was undertaken and 2

were lost to follow-up. There was no trend in the axis evolution from the initial ECG to the development of LAH. No syncope, sudden death or cardiac disease occurred in this group with 'newly acquired' LAH.

Fifty-nine subjects who had LAH at entry into the study made up group II. Follow-up data for an average of 9,3 years (range 1 - 23 years) were obtained in 40 subjects. Nineteen subjects were seen only once at the Institute for Aviation Medicine and never took up flying thereafter. Seven subjects developed hypertension in between 1 and 14 years of the follow-up period. One subject had a myocardial infarct and subsequent coronary artery bypass surgery 18 years after entry. Another pilot had mitral valve prolapse throughout observation.

The prevalence of bifascicular block was: LAH + right bundle-branch block (RBBB) 0,054%, and no subject proceeded to complete atrioventricular block. The presence of left posterior hemiblock was not studied. There was no temporal or sequential relationship between the development of LAH and RBBB. LAH did not precede left bundle-branch block.

Discussion

The conflicting results of studies on LAH, and its significance, should be interpreted with caution, due to selected populations studied and different criteria for LAH used.

In Barret *et al.*'s³ extensive review of published reports, the prevalence of LAH ranged from 0,9% in healthy airmen to 14% in male civil servants. Three studies using similar criteria to ours found rates of 1,4% and 1,5% in the general population and 4,58% in patients attending a cardiology service.⁴

Our data support the view that isolated LAH does not increase the risk of subsequent coronary events or death.³ There is little information on syncope and sudden death in newly acquired LAH; however, our subjects in this group remained asymptomatic.

The prevalence of bifascicular block (LAH + RBBB) has previously been reported as 0,008% in 237 000 airmen⁵ compared with 0,17% in the general population and 1% in hospital based studies.⁴ No atrioventricular block, syncope or increased mortality was reported after 11 years' follow-up in the group of airmen.⁵ This is similar to our data. It is generally agreed that in patients with an intraventricular conduction defect due to underlying cardiac disease, the prognosis and natural history parallels that of the disease itself.^{4,5}

We conclude that the prevalence of LAH in this select population of fit men is low. Provided history, examination, chest radiography and stress ECG are normal, LAH can be considered a normal variant that does not prevent the granting of a pilot's licence.

REFERENCES

- Rosenbaum MB, Elizari MV, Lazzari JO. *The Hemiblocks*. Oldsmar, Fla: Tampa Tracings, 1970.
- Willems JL, Robles de Medina EO, Bernard R *et al.* WHO/ISFC Task Force: criteria for conduction disturbances. *J Am Coll Cardiol* 1985; 5: 1261-1275.
- Barret PA, Peter CT, Swan HJC, Singh BN, Mandell WJ. The frequency and prognostic significance of electrocardiographic abnormalities in clinically normal individuals. *Prog Cardiovasc Dis* 1981; 23: 299-319.
- Siegmán-Igra Y, Yahani JH, Goldbourt U, Neufeld HN. Intraventricular conduction disturbance: a review of prevalence, etiology and progression for ten years within a stable population of Israeli adult males. *Am Heart J* 1978; 96: 669-679.
- Rotman M, Treibwasser JH. A clinical and follow up study of right and left bundle branch block. *Circulation* 1975; 51: 477-484.

Department of Cardiology, Institute for Aviation Medicine, Verwoerdburg, Tvl

E. R. SOICHER, M.B. CH.B.

C. W. BARLOW, M.B. B.CH.

D. P. MYBURGH, M.B. CH.B., F.A.C.C.