# *Withdrawal of Digoxin in General Practice in Elderly Patients*

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The adage that 'once on digoxin, always on digoxin' has been recently questioned. Digoxin has a narrow therapeutic range and serious toxic effects. The topic has been comprehensively reviewed in the Drugs and Therapeutics Bulletin[1] which emphasises the toxicity of cardiac glycosides in elderly patients, especially if there is renal impairment, and suggests that digoxin should be withdrawn in many patients who are in sinus rhythm.

Dall[2] showed that digoxin could safely he withdrawn in three-quarters of patients in sinus rhythm. In another study[3] out of 46 patients with heart failure, 12 patients in sinus rhythm deteriorated when digoxin was stopped and they improved when this was recommenced. Johnston and McDevitt[4] showed that 33 out of 34 patients in sinus rhythm with sub-therapeutic levels remained well without digoxin. A higher number of those in the therapeutic range required reintroduction of digoxin. A recent American study claims that stopping digoxin can lead to haemodynamic deterioration on left ventricular function in the absence of symptoms, and that digoxin has a significant ino-tropic effect, even in subtherapeutic levels.[5]

**Table 1**

| | | Digoxin Level | | |
|---|---|---|---|---|
| Rhythm | No. | Subtherapeutic | Therapeutic | Supratherapeutic |
| Regular | 19 | 15 | 4 | 0 |
| Irregular | 10 | 7 | 2 | 1 |

The withdrawal of digoxin in patients with atrial fibrillation is more controversial. As early as 1943, Rogan[6] showed that withdrawal of digoxin in three-quarters of patients with atrial fibrillation resulted in cardiac decompensation. Johnston and McDevitt"s study, also showed that patients with atrial fibrillation are more likely to deteriorate without digoxin. Because of the well documented toxicity of digoxin, and in the light of the evidence presented above, we studied the effects of withdrawal of digoxin in a select number of our patients.

**Methods and Results**

Twenty-nine patients on maintenance digoxin were identified from repeat prescriptions. The daily dosage varied between 0.0625 mg and 0.375 mg per day. Each patient was examined and found to be free of cardiac failure before being considered for the study. Standard serum digoxin levels were done on all these patients. The results are seen in Table 1. It was decided to study the effects of digoxin withdrawal in the patients in the sub-

**Table 2**
Patients in whom Digoxin was stopped

| Patient | Diagnosis | Age/Sex | Serum Digoxin (nmol/1) | Rhythm | Apex Beat/ Per Min. |
|---|---|---|---|---|---|
| 1.* | Myocardial Ischaemia | 66 F | 0.6 | Regular | 72 |
| 2. | Palpitations | 80 M | <0.5 | Regular | 72 |
| 3. | Myocardial Ischaemia | 86 F | <0.5 | Regular | 76 |
| 4.* | Myocardial Ischaemia | 89 F | 0.6 | Irregular | 84 |
| 5. | Myocardial Ischaemia | 86 F | <0.5 | Regular | 75 |
| 6. | Myocaridal Ischaemia | 65 F | 0.8 | Regular | 72 |
| 7.* | Myocardial Ischaemia | 78 M | 0.7 | Regular | 84 |
| 8.* | Rheumatic Heart Disease | 82 F | 0.7 | Regular | 80 |
| 9. | Myocardial Ischaemia | 61 M | 0.5 | Regular | 84 |
| 10. | Myocardial Ischaemia | 80 F | 0.7 | Regular | 72 |
| 11. | Myocardial Ischaemia | 72 M | 0.5 | Irregular | 76 |
| 12. | Myocardia! Ischaemia | 71 M | 0.8 | Regular | 84 |
| 13. | Myocardiai Ischaemia | 62 F | 0.6 | Regular | 75 |
| 14. | Palpitations | 72 F | 0.7 | Regular | 72 |
| 15. | Myocardial Ischaemia | 71 M | 0.6 | Regular | 76 |

(Therapeutic Digoxin Level; 1.3-2.6 nmol/1)

herapeutic group. Seven patients were withdrawn from this group for a variety of reasons, such as lack of cooperation and understanding and the presence of multiple disease. The remaining 15, of whom 13 were in regular rhythm and two in irregular rhythm, were assessed a week, two weeks and a month after stopping digoxin. The digoxin level, rhythm and apex beat of this group are summarised in Table 2. The first patient was withdrawn a week later for multiple medical reasons. Two patients developed tachycardia and one patient developed a fast irregular pulse from a previously regular rhythm. These patients were restarted on digoxin. The remaining 11 patients remained symptom-free and a month later, none was found to be in cardiac failure. tIn no case was it necessary to start or increase diuretics.

## Discussion

Digoxin has been successfully stopped previously in general practice studies.[7,8] In both these studies, renal biochemistry was measured in addition to clinical assessment and digoxin measurement. We did not do routine ECGs as we felt they would not have influenced our management of any of the patients. Although our study was limited to clinical assessment, digoxin therapy can be assessed adequately by clinical observation and close follow-up of the patients, especially in the acute withdrawal stage, so that patients who show evidence of early cardiac decompensation can have digoxin, or diuretics, instituted immediately, as there is evidence that treatment for patients in sinus rhythm with cardiac failure should commence with diuretics.[9] Beeson[10] has stated that 'the mere demonstration that digitalis can increase the efficiency of the cardiac pump, does not justify giving the drug to everyone who has had heart failure'. We have shown that one-third of our elderly patients, on long-term digoxin, have had this withdrawn successfully without cardiac decompensation. Although the risk of cardiac decompensation recurring after the period of follow-up remains, this would seem to be a poor justification for prophylactic use of digoxin. This supports the contention that there is less place for digoxin in the elderly than is current practice.


## Summary

Twenty-nine patients over 60 in a general practice had digoxin levels estimated.

Fifteen patients with subtherapeutic levels of digoxin were considered suitable for withdrawal of treatment on clinical grounds. One month later, 11 patients were still off digoxin and in good health, the other four requiring reintroduction of the drug.



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## References


1. *Drugs and Therapeutics Bull.* (1979). 17: 49-51.
2. Dall J.L.C. (1970). Maintenance Digoxin in elderly patients. *Brit. Med. J.* 2: 705.
3. Dobbs S.M., Kenyon W.I. and Dobbs H.J. (1977). Maintenance Digoxin after an episode of heart failure; placebo-controlled trial in outpatients. *Brit. Meet. J.* 1: 749-752.
4. Johnsion G.D. and McDevitt D.G. (1979). Is maintenance Digoxin necessary in patients with sinus rhythm? *Lancet.* 1; 567-570.
5. Arnold S.B-, Byrd R.C., Meister W. et al. (1980). Long-term Digitalis therapy improves left ventricular function in heart failure. *New Engl. J. Med.* 303: 1443-1448.
6. Rogen A.S. (1943). Maintenance treatment with Digoxin, *Brit. Med. J.* 1: 694.
7. Liverpool Therapeutics Group. (1978). Use of Digitalis in general practice. *Brit. Med. J.* 2: 673-675.
8. Brown J, and Manning A.D. (1977). Monitoring the dose of Digoxin. *J. Roy. Coll. Gen. Practit.* 27: 470-475.
9. McHaffie D., Purcell, H., Mitchell-Heggs P. and Guz A. (1978), The clinical value of Digoxin in patients with heart failure and sinus rhythm. *Quart. J. Med.* 188: 401-419.
10. Beeson P. (1980). Withering revisited. *New Engl. J. Med.* 303: 1475-1476.