Upsala J Med Sci 88: 141–149, 1983

What Do Patients Know About Their Digitalis?

A comparison between two different areas in Sweden

Kurt Boman,[1] Hans Möllerberg[2] and Jan-Erik Ögren[3]

From the [1]Department of Internal Medicine, [2]Central Laboratory, and [3]the Pharmacy of Skellefteå Hospital, Skellefteå, Sweden

ABSTRACT

Out of 1183 unselected out-patients in Skellefteå and 620 in Upsala, 200 patients from each place were selected at random to be sent a questionnaire on their medication with digitalis. Answers to the questionnaires were obtained from 196 patients (98 per cent) in Skellefteå and from 163 patients in Upsala (82 per cent). About 85 per cent stated that they took their digoxin as prescribed once a day. About 60 per cent knew correctly why digoxin treatment was given and 20 per cent were uncertain as to why they took digoxin. About 45 per cent stated that they felt improved thanks to the digoxin therapy. 55 per cent did not know about digitalis side-effects. About 50 per cent denied having received any information about digitalis and 50 per cent were unsatisfied with the information they had been given. Only 15 per cent were content with the information. Methods for improving the information to patients are proposed.

INTRODUCTION

Several studies have disclosed that out-patients know very little about their drugs and find it difficult to comply with the conditions of the prescription (1,6,8). Due to the narrow therapeutic range, it is particularly important that the prescribing of digitalis, one of the drugs most commonly prescribed for elderly people, is adhered to closely. Two British studies (9,10) showed that about half of the out-patients did not take their doses of digitalis exactly as prescribed. The purpose of this study was to find out, what patients in a small town (Skellefteå) knew about their digitalis medication as compared with patients in a university city (Upsala).

PATIENTS

During the three months, July to September 1978, 1345 prescriptions of digoxin (Lanacrist(R), Draco) were made up at the pharmacy of Skellefteå Hospital and the pharmacy (Nordstjärnan) in Skellefteå. These pharmacies serve an area with 40 000 inhabitants. Out of these 1345 prescriptions 1183 could be used to identify patients eligible for the study. There were 678 females and 505 males. A random sample of 250 patients was taken from this population, and 200 of these participated in the study. The 50 extra patients were used if some of the first 200 patients had moved, died or could not be found. This was true for 10 patients. The 200 patients participating in the study were randomized into two groups: the A group with 56 females and 44 males and the B group with 71 females and 29 males.

In the Upsala pharmacy (Kronan) 671 prescriptions were handled during the same period as in Skellefteå. 620 of the prescriptions were eligible for the study. A random sample of 300 patients was chosen, and out of these 200 were selected for the study. There were 100 patients kept in reserve, 50 for each A and B group. Of the first 200 patients in Upsala 76 had moved, died or could not be found, so 76 patients from the reserves were added to the material. The A group comprised 48 females and 52 males and the B group 57 females and 43 males. The age distributions of the random samples in Skellefteå and Upsala are shown in Figure 1.

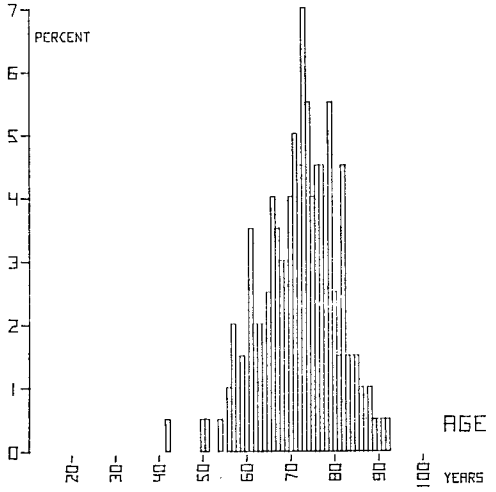

Fig 1 A. The age distribution of 200 patients (random sample) on digoxin in Skellefteå.

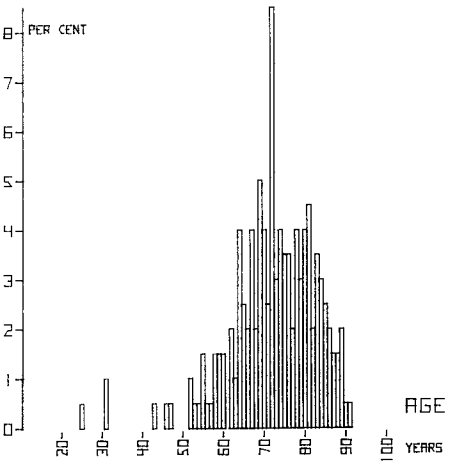

Fig 1 B. The age distribution of 200 patients (random sample) on digoxin in Upsala.

The health district of Skellefteå had 80 000 inhabitants in 1981. There were 66 medical posts, 36 of which were attached to the hospital, and 30 to district medical officers. During the main part of 1978 only seven out of 25 posts for district medical officers were permanently occupied. The rest were attended to by locums for short periods. This is a common situation in the northern part of Sweden but not in Central Sweden. So a comparison was made with Upsala, where there were 594 physicians, 459 of whom worked at the University Hospital, and 135 being district medical officers. The Upsala area had 1.3 million inhabitants.

METHODS

The participants were sent a questionnaire with nine questions about e.g. the duration of digitalis treatment, its dosage and how the patients complied with it. The patients were also asked if they knew why they were taking digitalis, if their symptoms had improved following treatment with digitalis, and if they knew anything about possible side-effects. There were questions about the sources of their information on the drug and whether they considered the information to be adequate. The nine questions of the questionnaire were identical for all the patients but the A and B group were given different additional information to find out if the language used in the questionnaire could bias the answers. The A group was told: "It is important not to take more of the drug than needed. This is especially true for Lanacrist(R). If you take too much of the drug, certain unpleasant side-effects may arise". The B group was warned: "It is important not to take too little of the drug which is needed for your treatment. This is especially true for Lanacrist(R). You should take exactly the dose prescribed and not be careless". The prescribed digoxin dosage in relation to the age of the patients was registered.

Patients in both Upsala and Skellefteå who failed to reply were requested once again to answer the questions.

The use of prescriptions for identifying the participants was approved by Socialstyrelsens läkemedelsavdelning (National Board of Health and Welfare, Department of Drugs).

RESULTS

Reply rate

Answers to the questionnaires were received from 196 patients in Skellefteå (98 per cent) and from 163 patients (82 per cent) in Upsala. The difference in the reply rates is statistically significant ($p < 0.001$). In Skellefteå and Upsala answers were received from 97 and 77 patients respectively in group A, compared with 99 and 86 patients respectively in group B. There were no significant differences in the answering rates between the A and B group neither in

Skellefteå (97, 99) nor in Upsala (77, 86). In Skellefteå the extra information given seems to have biased the answers, as the patients of the B group who were reminded not to be careless in taking their medicine, reported a significantly ($p < 0.05$) higher compliance than patients of the A group. A similar tendency was found in Upsala, where none in the B group but five in the A group admitted that they had been careless.

Digoxin dosage and age

The mean daily dosage of digoxin calculated from the respective 1152 and 619 prescriptions was 0.193 mg per day in Skellefteå and 0.212 mg per day in Upsala. This indicates that more patients took 0.25 mg per day (57 per cent versus 50 per cent) in Upsala than in Skellefteå. The dose fell gradually with increasing age in both Skellefteå and Upsala (Fig 2). The correlation coefficient were in Skellefteå 0.291 and Upsala 0.243 and are significantly different from zero ($p < 0.001$).

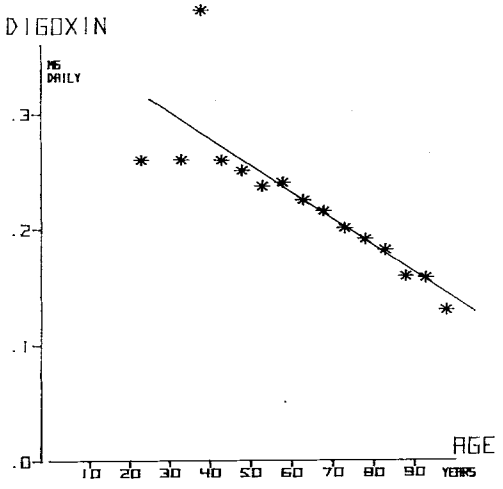

Fig 2 A. The relation between the age and digoxin dosage of 1152 patients in Skellefteå. The correlation coefficient r=0.291. (*= The mean digoxin dosage for each five year age interval).

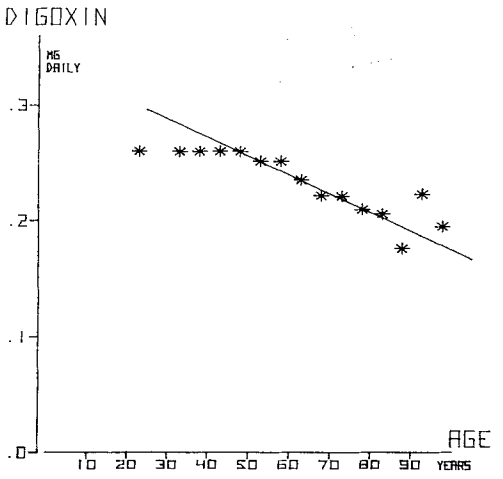

Fig 2 B. The relation between the age and digoxin dosage of 619 patients in Upsala. The correlation coefficient r=0.243. (*= The mean digoxin dosage for each five year age interval).

Results of the questionnaires
(Percentage of 196 patients in Skellefteå and 163 in Upsala)

SKELLEFTEÅ		UPSALA	
Question 1. "How long have you been taking Lanacrist?"			
No answer	2	3	
Not quite sure	3	4	
More than 5 years	39	49	
2-5 years	27	27	
1-2 years	16	6	($p < 0.01$)
Less than 1 year	11	1	
Have discontinued	2	10	
	100	100	

	SKELLEFTEÅ	UPSALA	
Question 2. "What is the dose per tablet?" (it is printed on the bottle)			
No answer	0	7	
Do not know	4	2	
0.13 mg	46	34	
0.25 mg	50	57	
	100	100	
Question 3. "How many tablets do you take each time?"			
No answer	1	8	
½ tablet	1	2	
1 tablet	91	83	
1½ tablet	4	4	
2 tablets	1	3	
Another dosage	2	0	
	100	100	

One patient who had mistaken Nitroglycerin for Lanacrist stated that he could take 12 tablets per day.

Question 4. "How often do you really take Lanacrist?"			
No answer	1	6	
Every day	91	85	
Skip it sometimes	5	2	
Skip it always Only on demand	1	1	
Have discontinued	2	2	
	100	100	
Question 5. "For what complaints do you take Lanacrist?"			
No answer	4	9	
Not quite sure	18	17	
Headache	3	1	
Irregular pulse	15	9	
Insomnia	5	1	
Ankle swelling	7	9	
High blood lipids	2	2	
Body pain	2	1	
Respiratory distress	14	16	
Chest pain	18	14	
Hypertension	3	12	($p < 0.01$)
Heart failure	53	44	
Others such as heart enlargement, after myocardial infarction	8	6	

Some patients gave several answers.

Irregular pulse, ankle swelling, respiratory distress, and heart failure were regarded as the right indications for digoxin treatment.

Question 6. "Did you improve on Lanacrist?"			
No answer	3	10	
No	4	3	
Yes	49	38	
Difficult to say	44	49	
	100	100	

	SKELLEFTEÅ	UPSALA	
Question 7. "What are the unpleasant side-effects of Lanacrist?"			
Not quite sure	57	53	
Headache	3	4	
Nausea, vomiting	6	12	
Diarrhoea	2	3	
Anorexia	5	6	
Everything is looking yellow	4	1	
Tiredness	7	10	
Respiratory distress	6	4	
Irregular pulse	4	4	
Vertigo	8	8	
Insomnia	7	4	
Ankle swelling	4	3	
Heartburn	5	1	
Other	6	5	

Some patients gave several answers.

Question 8. "Who or what has told you what you know about Lanacrist?"			
No answer	4	12	($p<0.01$)
Nobody has told me	54	50	
Relatives, friends	4	2	
Newspaper	5	5	
Radio or television	2	0	
Nurse	2	2	
Doctor	31	33	
Pharmacy or others	1	3	

Some patients gave several answers.

Only 37 per cent of the patients in Skellefteå who had been informed by their doctors, were satisfied with the information they received.

Question 9. "Is the information sufficient?"		
No answer	9	15
Yes	14	18
No	51	48
Do not know	26	19
	100	100

DISCUSSION

The unusually high reply-rate in Skellefteå indicated that these patients were interested in the study. The significantly lower reply-rate in Upsala may be because the study was remotely controlled from the District of Skellefteå. Moreover it was easier for the authors to reach the patients in Skellefteå, where many were known personally. Significantly ($p< 0.001$) more patients in Upsala were also taken from the reserves. Another discrepancy was that significantly ($p< 0.05$) more women in Skellefteå were randomly chosen for the study. This could perhaps influence the answers as there might be sex-dependent differences in morbidity and medication. Maybe there were other reasons for this discrepancy in reply-rate, suggesting that conclusions based on the

differences between Upsala and Skellefteå should be made cautiously. The results of the questionnaire as a whole should also be interpreted with caution, as the answers could have been influenced by the language used. However, the doses and dosages of digoxin issued agreed well with the results of another study in the District of Skellefteå (5). Interestingly, about 15 per cent of patients in Skellefteå answered "irregular pulse", which probably meant atrial fibrillation, and corresponded fairly well to the 20 per cent ECG-verified occurrence of atrial fibrillation in digoxin-treated patients (5).

The lower digoxin dosage in the elderly when compared with the younger patients in both Skellefteå and Upsala probably reflects the physicians' fear of causing digitalis intoxication in the elderly. The age of the patient is said to be one of the factors influencing sensitivity to digoxin (7), due to diminished renal function and low body weight. Moreover, a majority of digitalis-intoxicated geriatric patients in Skellefteå (4) had serum digoxin levels within or below the therapeutic range, suggesting an age dependent sensitivity to digitalis.

One of the few significant differences in the answers between Skellefteå and Upsala was the large number in Upsala who thought that Lanacrist was given for hypertension ($p < 0.01$). The difference is difficult to explain. It could be attributed to chance or maybe the fact that the indication for treatment was more often printed on the prescriptions in Skellefteå than in Upsala (70 per cent versus 40 per cent).

Otherwise the similarities in the answers to the questionnaire between Upsala and Skellefteå are obvious. Lack of knowledge or misunderstanding as to why the patients were taking digitalis may have several causes. The information was not provided, it was not understood, it had been forgotten, the doctor-patient contact was too poor, the doctors were changed too often, the patient was hard of hearing and so on. It was quite obvious from questions 9 and 10 that many patients knew little or nothing about their disease or its treatment. They also knew little about the possible digitalis side-effects. Intoxication by digitalis remains a major clinical problem. Beller et al (2) found that as many as 30 per cent of the in-patients were suffering from digitalis intoxication. Of 91 out-patients in Skellefteå, 5 per cent were found to be certainly intoxicated and 2 per cent possibly so (5). In Skellefteå about 5 per cent knew about the adverse effects of digitalis, but on the other hand just as many listed symptoms that could not be ascribed to it. If patients erroneously attribute adverse reactions to treatment by digitalis they might discontinue the digitalis therapy. The occurrence of intoxication by digitalis could be reduced if patients knew more about its side-effects. They might then earlier recognise the signs of intoxication and so report earlier to their doctors.

Many patients found it difficult to state if they had been improved by digi-

talis treatment. This might have been because the treatment and/or the diagnosis were wrong or diuretic treatment had made it difficult to assess the efficacy of digitalis. This agrees with the results of other studies showing that many geriatric patients are digitalized unnecessarily (3).

From this study it is obvious that the information given to or understood by patients is insufficient. It was not known how many patients were correctly informed, but forgot or misunderstood the information given. It is important to make sure that the patient has understood the information and to repeat it, in order to achieve effective medication with digitalis. One of the most common reasons for a breakdown in patient-doctor communication is probably frequent changes of doctors. The patients were generally informed by their doctors which is both natural and desirable. Additional information and explanation could be given by nurses to both out-patients and in-patients. Pharmacists may supplement this information through practical advice about the storage of the drug, its stability, the importance of taking the correct doses at the correct time and how to take it in relation to food.

A necessary condition for a well-functioning patient information system is that the patient always meets the same doctor for consultation. Another prerequisite for good communication is that the doctor uses a language that the patient can understand. Maybe other changes in the medical care are necessary. Good continuity is also important when judging the efficacy of the digitalis treatment, when a decision is made to discontinue or continue a given treatment. In this way unnecessary digitalis medication may be avoided.

Guided by the results of the present studies we hope that the following steps will assist in improving the patients knowledge of their medication.

When digoxin treatment is started:

- Tell the patient the name of the cardiac glucoside being used and why treatment has to be started.
- Tell the patient what symptoms will probably be relieved by the treatment.
- State the dosage, the length of treatment and the importance of taking the doses exactly as prescribed.
- Make the patient aware of the adverse effects which necessitates a new consultation with the doctor.
- Give all this information to the patient in writing as well as verbally.
- Write on the prescription the symptom(s) which the drug will relieve or cure.
- Record the indication for the treatment.

At the next visit:

- Ask for details of any improvement in heart symptoms and ask for any adverse effects.
- At each visit reconsider if the dosage should be changed or digitalis should be withdrawn.
- Ask the patient if he/she understood the information and supplement it if necessary.

- Emphasize the importance of taking the medicine in the doses and at the intervals exactly as prescribed.

Many of these suggestions are familiar and obvious and are already followed widely. However, it appears to be very difficult to get information across to patients. If these proposals are followed, we hope that digitalis intoxications and unnecessary digitalis prescribing will decrease and that improved cooperation by patients will be achieved, particularly among those who need digitalis therapy.

ACKNOWLEDGEMENTS

We would like to thank the National Corporation of Swedish Pharmacies, pharmacist Gunnar Eriksson at the pharmacy (Kronan) in Upsala, and Ass. prof. Göran Sundlöf , Department of Internal Medicine, Akademiska sjukhuset, Upsala, for valuable cooperations.

REFERENCES

1. Ander, S. & Tibblin, S.: Människors medicinska kunskaper. Soc Med Tidskr häfte 1974; 10: 654 - 660.
2. Beller, G.A., Smith, T.W., Abelman, W.H., Haker, E. & Hood, W.B.: Digitalis intoxication. A prospective clinical study with serum level correlations. N Engl J Med. 1971; 284: 989 - 997.
3. Boman, K., Allgulander, S. & Skoglund, M.: Is maintenance digoxin necessary in geriatric patients? Acta Med Scand 1981; 210: 493 - 495.
4. Boman, K.: Digitalis intoxication in geriatric in-patients. Acta Med Scand. Accepted for publication.
5. Boman, K. & Möllerberg, H.: Digoxinintoxikation i ett oselekterat patientmaterial. Läkartidningen 1979; 76: 4108 - 4110.
6. Böttiger, L.E.: Kan patienten rätt sköta sin medicinering? Nord Med 1969; 82: 1605 - 1606.
7. Ewy, G.A., Kapadia, G.G., Yao, L., Lullin, M. & Marcus, F.I.: Digoxin metabolism in the elderly. Circulation 1969; 39: 449 - 453.
8. Hellström, K. & Leijd, B.: Vad vet patienter om sina sjukdomar och deras medikamentella behandling? Läkartidningen 1976; 73: 968 - 970.
9. Johnston, G.D. & Mc Devitt, D.G.: Digoxin compliance in patients from general practice. Brit J Clin Pharmacol 1978; 339 - 343.
10. Johnston, G.D., Kelly, J.G. & Mc Devitt, D.G.: Do patients take digoxin? Br Heart J 1978; 40: 1 - 7.

Adress for reprints:

Kurt Boman, M.D.
Department of Internal Medicine
Skellefteå hospital
931 86 SKELLEFTEÅ
Sweden