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Adherence to guidelines for amiodarone monitoring at Benghazi cardiac center, Benghazi, Libya

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Abstract
Background: Amiodarone is anti-arrhythmic but the clinical usefulness is complicated by its extensive side effect which necessitates careful patient's selection and monitoring.
Objective: The purpose of this study is to assess adherence to published guidelines for monitoring amiodarone at out patients setting of Benghazi cardiac center.
Patients & Method: Across sectional retrospective study of out patients attending Benghazi cardiac center from April 2009 to April 2010 who were chronically on amiodarone therapy assessed retrospectively regarding their demographic data, reason for initiation, duration of therapy, the occurrence and timing of laboratory tests which recommended by guidelines. Thyroid function test was sent during the study for all patients.
Results: 22 out of 43 patients on amiodarone who attend the center in the study time frame was interviewed in OPD and their files were searched .14 were female, the mean age was 59.8+/-10.3, mostly the indication for amiodarone therapy was ventricular arrhythmia 17/22 (77.3%), a trial 4/22(18.2%), and no clear indication in 4.5%. Mean duration of therapy was 14.7+/- 10.5 months, range (6-36), regarding baseline monitoring the adherence rate for TFT, LFT, CXR and PFT were 27.3%, 4.5%, 0%, 0%, while chronic monitoring 4.5%, 4.5%, 0% respectively. TFT during the study shows that the thyroid dysfunction rate was 42.11%.
Conclusion: The adherence rate to published monitoring guidelines and Package insert recommendations for amiodarone in our Benghazi cardiac center was low.

Keywords: amiodarone, monitoring, adherence, Benghazi cardiac center, Libya

1. Introduction

Amiodarone is a potent anti-arrhythmic drug [1], Used in treatment of ventricular and supra ventricular arrhythmias [2], Its benzofuranic derivative, its iodine containing compound with some structural similarity to thyroxin [3, 4] It has been associated with toxicity involving the lungs, thyroid gland, liver, eyes, skin, and nerves which occur at considerable rate. Although amiodarone adverse effect is duration and dose dependent it can happen even at low doses [5-7]. Most of the guidelines and package insert of the drug recommend specific monitoring tests at baseline and during therapy mostly at 6-month interval. One of the most used table for monitoring is Consensus recommendations from NASPE (North American society of pacing and electrophysiology). Table 1 show this [1]

Shaded areas indicate procedures that should be performed at a specific visit.

Patient name: _____ Date of birth: _____ Chart no.: _____

Date →	Baseline	Loading	6 months	6 months	6 months	6 months	6 months	6 months
Amiodarone monitoring								
Complete H&P with special attention to HF, arrhythmia, and concomitant medications								
H&P directed at anticipated adverse effects								
Heart rate surveillance								
Thyroid studies								
Liver transaminase levels								
Digoxin level (if taking digoxin)								
PT/INR (if taking warfarin [Coumadin]): at least once a week during first 6 weeks								
Chest radiograph		Also if any suspected pulmonary toxicity						
PFT, including DLco		Also if any suspected pulmonary toxicity						
Eye examination (if preexisting visual impairment)		Also if any visual symptoms						

To our knowledge no data on the adherance to these guidelines at our benghazi cardiac center. Our aim to asses this adherance rate.

2. Patients and Method

Across sectional retrospective study of out patients attending Benghazi cardiac center from April 2009 to April 2010 who were chronically on amiodarone therapy assessed retrospectively regarding their demographic data, reason for initiation, duration of therapy, the occurrence and timing of laboratory tests which recommended by guidelines (NASPE and by package insert, FDA and others) "namely TFT(thyroid function test), LFT (liver function test), CXR, (chest x-ray) pulmonary function test and eye examination.

TFT was sent during the study for all patients to determine the rate of thyroid dysfunction in the study sample. (Secondary aim).

3. Results

The total number of patients registered at cardiac center up to April 2010 was 492. Total number of patients with arrhythmia registered and has files is 97, 43 of them on amiodarone (44.3 %). Out of 43 on amiodarone 22 was attending in the study time frame (April 2009to April 2010) taken and interviewed in OPD and their files was searched retrospectively. The baseline characteristics of the sample are illustrated in table (2)

Table 2: The baseline characteristics of the patients in the sample

Patients characteristic (n = 22)		Number	%	Mean ± SD
Age				Total 59.8 ± 10.3 Male 59.5 ± 11.6 Female 60 ± 10.2
Sex	Male	8	36.4%	
	Female	14	63.6%	
Race	White	17	77.3%	
	Black	5	22.7%	
Indication of amiodarone therapy	1. Arial arrhythmia	4	18.2%	
	2. Ventricular arrhythmia	17	77.3%	
	3. Both	0	0%	
	4. No clear indication	1	4.5%	
Mean duration of therapy (months)				14.7 ± 10.5 months Range (6 – 36)
Site of living	1. Coaster	20	90.9%	
	2. Sub coaster	1	4.5%	
	3. Desert	1	4.5%	

The percentage of adherence to monitoring guidelines (NASPE and package insert recommendations, FDA) of amiodarone therapy in our sample illustrated in table 3

Table 3: The percentage of adherence to monitoring guidelines (NASPE and package insert recommendations) of amiodarone therapy.

Baseline monitoring test (n = 22)			Chronic monitoring test (n = 22)		
Test	**Number**	**% Adherence**	**Test**	**Number**	**% Adherence**
TFT			TFT every 6 month	1	4.5%
Screened	6	27.3%			
Documented in file	2	9%			
LFT	1	4.5%	LFT every 6 month	1	4.5%
CXR	0	0	Yearly CXR	0	
PFT DLCO	0	0			

Actually the only patient undergo continues chronic monitoring for TFT at 4-month interval he had baseline high TSH (TSH = 6.3) also only one patient monitored for LFT every 3 months because she developed amiodarone induced hepatitis return to normal after she stop therapy.

There is no pulmonary or eye screening neither as baseline nor as chronic monitoring

We search the files for any adverse effect in thyroid, hepatic or pulmonary developed during amiodarone therapy, and the result illustrated in table (3).

Table 4: Adverse effect in thyroid, hepatic or pulmonary developed during amiodarone therapy.

Adverse effect		Number	Response of cardiologist
Thyroid dysfunction	Hypothyroidism	1 out of 6	No clear response in file
	Hyperthyroidism	0	
Hepatitis		1	Decrease dose of amiodarone then stopped and follow up with LFT
Pulmonary toxicities		No history were taken and no screening	

During the study we send TFT for all patients in the study sample, and table (5) and figure (1) show their thyroid status.

Table 5: Thyroid function test during the study for all patients in the study sample

Thyroid dysfunction	Number of patients
Subclinical hypothyroidism	6
Clinical hypothyroidism	1
Clinical hyperthyroidism	1
Euthyroid	11

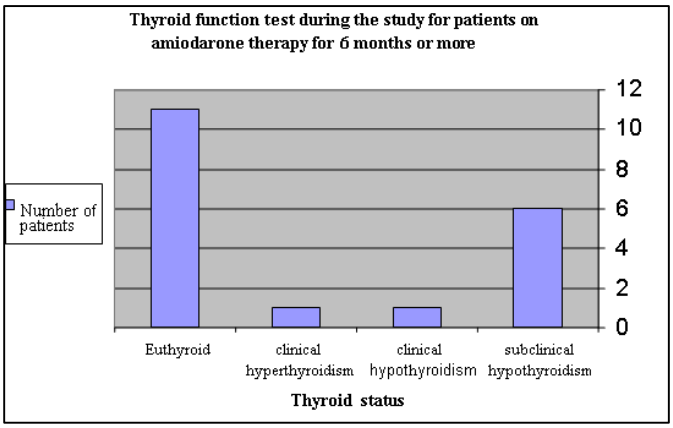

Fig 1: Thyroid function test during the study for patients 6 month on amiodarone treatment.

Discussion

Total number of patients diagnosed with arrhythmia registered in our Benghazi cardiac center was 97, 43 of them on amiodarone (44.3%) which is markedly higher than prescriptions rate in Japan and the Philippines 0.3% and slightly high than Europe 34.5%, North America 32.8% but lower than Latin America 73.8%. Amiodarone use has increased globally since 1998 at a rate greater than that of the whole antiarrhythmic market especially sotalol despite its wide range of serious adverse effect [8].

Mostly the indication of amiodarone therapy in our study was ventricular arrhythmia (17) (77.3%) and a trial arrhythmia (4) (18.2%) and (4.5%) have no clear indication which is not acceptable for drug which has major side effect even with low dose.

Only 27.3% of patients initiated on amiodarone therapy screened by TFT at base line and this markedly lower (3 fold) than the rate determined by Courtney and their colleagues 2004 at their Medical University of South Carolina (MUSC) out patient clinic which was 75% (15/20) [9], and also lower than the rate reported by Stelfox and colleagues at a tertiary care hospital which was (52%) (52/99 patients) [10]

The baseline adherence rate for LFT, CXR and PFT in Benghazi cardiac center was (0%), which definitely lower than that in Courtney study 95%, 75%, and 30% respectively [9], and also lower than Stelfox study which range from 56-61% [10] figures 2 illustrate this.

As regard to chronic monitoring the rate of adherence for TFT was 4.5% (1/22) which dramatically lower than reported by Courtney 20% (4/20). [9].

And for other parameter LFT and CXR, the adherence rate 4.5% and 0% respectively, while in Courtney study 35% (7/20) and 50% (8/20) respectively, figures 3 illustrate this.

This dramatically low rate of adherence to guidelines of amiodarone monitoring is actually reflection of either unawareness of physician and cardiologist with side effects of amiodarone or the guidelines of drug monitoring. As we know if the patients are not adequately monitored, the risk of amiodarone therapy may outweigh its beneficial anti arrhythmic effects [11, 12],

Out of 6 patients who screened regarding thyroid dysfunction one patient developed hypothyroidism (16.6%), which is markedly lower than the rate estimated during the study which was 42.1% (31.5% they develop sub clinical hypothyroidism, 5.2% they develop clinical hypothyroidism and 5.2% develop clinical hyperthyroidism).

the prevalence of AIH (amiodarone induced hypothyroidism) (36.7 % submission of subclinical and clinical hypothyroidism) and AIT (amiodarone induced thyrotoxicosis) (5.2%) in our study comparable to study conducted by Batcher *et al*. 2007 which show prevalence of AIH 30.8 %and AIT 5.3% [13]

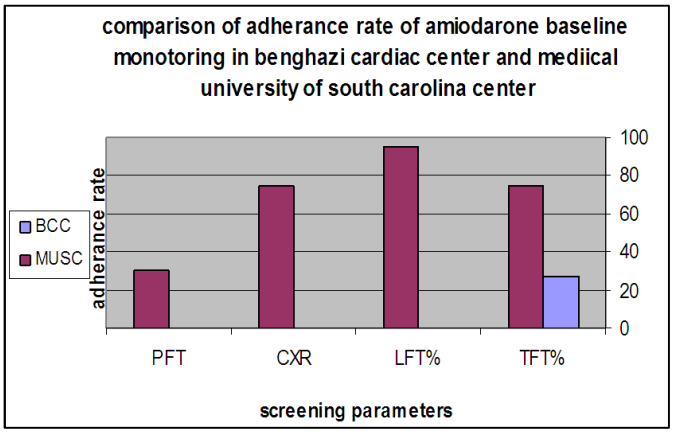

Fig 2: Comparison of adherence rate to guidelines of amiodarone baseline monitoring in Benghazi cardiac center and medical university of South Carolina center.

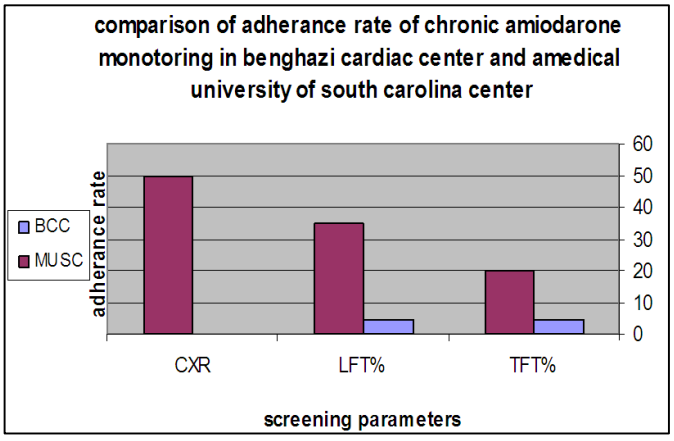

Fig 3: Comparison of adherence rate guidelines of chronic amiodarone monitoring in Benghazi cardiac center and medical university of South Carolina center.

References

1. Goldschlager N, Epstein AE, Naccarelli G, Olshansky B, Singh B. Practical guidelines for clinicians who treat patients with amiodarone. Practice Guidelines Subcommittee, North American Society of Pacing and Electrophysiology. Arch Intern Med. 2000; 160:1741-8.

2. Cleland JGF, Dargie HJ, Findlay IN, Wilson JT. Clinical, haemodynamic, and antiarrhythmic effects of longterm treatment with amiodarone of patients in heart failure. Br Heart J. 1987; 57:436-445.
3. Lyle A, Suddoway MD. York Hospital, York, Pennsylvania Amiodarone: Guidelines for Use and Monitoring.
4. Pourbaix S, Berger Y, Desager JP, Pacco M, Harvengt C. Absolute bioavailability of amiodarone in normal subjects. Clin Pharmacol Ther. 1985; 37:118-23.
5. Physicians' desk reference. 56th ed. Montvale, N.J.: Medical Economics. 2002.
6. Connolly SJ. Evidence-based analysis of amiodarone efficacy and safety. Circulation. 1999; 100:2025-34.
7. Pollak PT. Clinical organ toxicity of antiarrhythmic compounds: ocular and pulmonary manifestations. Am J Cardiol. 1999; 84:37R-45R.
8. Stuart J. Connolly, Evidence-Based Analysis of Amiodarone Efficacy and Safety. 1999. http://dx.doi.org/10.1161/01.CIR.100.19.2025.
9. Courtney L. Bickford, PharmD, BCPS, and ANNE P. SPENCER, PharmD, BCPS Adherence to the NASPE Guideline for Amiodarone Monitoring at a Medical University Journal of Managed Care Pharmacy.
10. Stelfox HT, Ahmed SB, Fiskio J, Bates DW. Monitoring amiodarone's toxicities: recommendations, evidence, and clinical practice. Clin Pharmacol Ther. 2004; 75:110-22.
11. Vorperian VR, Havighurst TC, Miller S, January CT. Adverse effects of low dose amiodarone: a meta-analysis. J Am Coll Cardiol. 1997; 30:791-98.
12. Counihan PJ, McKenna WJ. Risk-benefit assessment of amiodarone in the treatment of cardiac arrhythmias. Drug Safety. 1990; 5:286-304.
13. Batcher EL1, Tang XC, Singh BN, Singh SN, Reda DJ, Hershman JM, SAFE T. Investigators. Thyroid function abnormalities during amiodarone therapy for persistent atrial fibrillation. Am J Med. 2007; 120(10):880-5.