

Clinical Profile And Side Effects Of Chronic Use Of Oral Amiodarone In Cardiology Out Patients Department

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Abstract

Background: Amiodarone is a widely utilized antiarrhythmic drug effective in managing various cardiac arrhythmias, particularly atrial fibrillation and ventricular tachycardia. However, its chronic use is associated with a spectrum of side effects, necessitating careful monitoring in outpatient settings.

Objectives: The objective of this study is to describe clinical profile of patients using oral amiodarone for various cardiac indications visiting cardiology outpatient departments and to know frequency of its side effects.

Study Design: A cross sectional descriptive study

Place and Duration of the Study: Department of Cardiology, MTI Gajju Khan Medical College, Swabi, KP, Pakistan from January 2019 to December 2020.

Methodology: A total of 200 patients visiting cardiology OPD and using oral amiodarone for various indications were included in the study. Demographic and clinical data of the patient were obtained. Side effects were assessed through clinical examination, chest x-rays, pulmonary function testing, abdominal ultrasound, liver functions testing and serum TSH estimation. Data was analyzed statistically and measurement variables were described by means \pm standard deviations.

Results: Thyroid dysfunction was present in 40(20%) out of 200 patients with TSH level of 4.5 ± 1.2 mIU/. Pulmonary toxicity manifested in 30 (15%) patients with a decrease in lung capacity by $8 \pm 2\%$. Hepatotoxicity was found in 20 (10%) patients and neurological symptoms in the form of tremors in 24 (12%) patients. It affected the skin mainly in regard to photosensitivity in 36 (18%) patients. Thirty two 32 (16%) patients experienced at least one organ toxicity.

Conclusion: This study shows that chronic use of amiodarone is associated with multisystem serious adverse effects especially thyroid, pulmonary and hepatic side effects. These side effects imply that careful monitoring during routine follow-up appointments is imperative, so that patients can receive proper surveillance for toxicity and avoid serious side effects.

Keywords: Amiodarone, Chronic use, Side effects

INTRODUCTION

Amiodarone is a class III agent antiarrhythmic agent and is used for the management of various types of arrhythmias, including atrial and ventricular rhythms. It has found most application in the situations where no other antiarrhythmic interventions are feasible or well endured. The reason for seeing amiodarone as a drug for managing arrhythmias is because of its multipotent actions and its multi receptor and ion channel characterized by blocking potassium and both sodium and calcium channels as well as beta adrenergic receptors [1-2]. I wonder whether this multi-channel blocking

profile will enable amiodarone to maintain the rhythm control in the more complicated cases including left ventricular dysfunction or structural heart disease. However, long term use of oral amiodarone has several notable side effects which affect several organs of the body. Amiodarone contains high iodine content and has a long half-life that makes it to deposit in the body tissues contributing to organ toxicity. These diseases involve mainly the thyroid, pulmonary, hepatic, dermatologic and ocular systems [4-5]. The endocrine disturbance is one of the most common adverse effects (AE), manifesting with hypothyroidism or hyperthyroidism and occurring in up to 20–30% of patients on long-term therapy. The thyroid disorders observed during the use of amiodarone are related to the iodine content of this drug that influences the thyroid hormones production and turnover [6-7]. Pulmonary toxicity is pronounced and develops in 5-15% of patients undergoing long-term treatment. This can present as chronic interstitial pneumonitis, or less commonly pulmonary fibrosis. Pulmonary toxicity is best managed early because of the progressive respiratory failure that may result [8-9]. Hepatic dysfunction is estimated to develop in about 10% of patients and can be moderate to severe. The researchers therefore advise that liver function tests should be done periodically in order to check for liver toxicity [10]. Amiodarone has also some dermatological side effects, including photosensitivity and a perioral blue – gray skin discoloration that especially occurs in patients that received long term treatment and who were frequently exposed to sunlight. These side effects are generally only of aesthetic consequence but can be debilitating for the patient. Additionally, it was reported that corneal deposits may occur at a high incidence whereas optic neuropathy is rarer but patients required periodic ophthalmologic examinations [11-12].

The objective of the present work was to describe clinical characteristics of patients using oral amiodarone therapy for various cardiac arrhythmias and frequency of its adverse effects in our patients in a OPD set up. It will help us to know clinical characteristics of our patients using the said therapy and will know burden of toxicity from this drug in our local population.

METHODOLOGY

This was a cross sectional descriptive study conducted at Cardiology outpatient Department of Bacha Khan Medical Complex, a Teaching Hospital of Gajju Khan Medical College Swabi. A total of 200 patients who were using oral amiodarone in a dose of 200mg or more for more than six months with documented record were included in the study. Descriptive information about subjects such as demographic variables, risk factors for cardiovascular diseases and cardiac diagnosis for which amiodarone was started was obtained from patient record. All patients had clinical examination especially for thyroid, lung, liver, eye and neurological signs. Diagnostic investigation including thyroid function tests (TFTs), pulmonary function tests (PFTs), chest X-ray, liver function tests (LFTs) and ophthalmology examination by consultant ophthalmologist was done to screen and confirm various organ toxicities. Standard ECG was performed on all patients. On the basis of clinical indications more detailed investigation were carried out where necessary. Patients who have previous history of lung scarring due to any reasons, chronic liver disease due to hepatitis B and C virus and history of primary thyroid disorders were excluded after screening medical record.

Data Collection

The data was collected utilizing a structured proforma to document the demographic information, risk factors for IHD and comorbid conditions. The indication for cardarone use, duration of therapy and one or more side effects encountered were documented.

Statistical Analysis

Data was analyzed by Statistical Package for Social Science (SPSS) version 24. Quantitative data were described using measures of central tendency; means and standard deviations while qualitative data were described in terms of frequencies and proportions.

RESULTS

Among 200 patients, male were 120(60%) while rests were female. Mean age was 65.3±9.8 years. Common comorbidities included hypertension 150 (75%), diabetes mellitus 80(40%), hypercholesterolemia 34 (17%), smoking history 14(28%) and chronic obstructive pulmonary disease 50 (25%). Patients with atrial fibrillation (AF) and ventricular tachycardia (VT) were 110(55%) and 55(45%) respectively. These information are summarized in

table1. Thyroid dysfunction was present in 40 (20%); the mean thyroid-stimulating hormone level was 4.5 ± 1.2 mIU/. Pulmonary toxicity was seen in 30(15%) with mean decline in lung function capacity equal to $8 \pm 2\%$. Potential hepatotoxicity was noticed in 20(10%) patients. Photosensitivity was recorded in 36 (18%). As imminent neurological side effects, the tremor was reported by 24(12%) patients. These results are summarized in table no. 2 and 3. Fig.no.1 highlights these finding in graphical form.

Table -1: Baseline Characteristics of study participants.

Characteristics	Mean \pm SD/ n(%)
Age (years)	65.3 \pm 9.8
Male (%)	120(60%)
Diabetes Mellitus	80(40%)
Hypertension	150(75%)
Hypercholesterolemia	34(17%)
Smoking history	28(14%)
Primary Diagnosis - Atrial Fibrillation (%)	110(55%)
Primary Diagnosis - Ventricular Tachycardia (%)	90(45%)

Table -2: Adverse Effects of Chronic Amiodarone Use

Adverse Effects	Number of Patients (%)
Thyroid Dysfunction	40(20%)
Pulmonary Toxicity	30(15%)
Hepatotoxicity	20(10%)
Dermatologic Effects	36(18%)
Neurological Effects	24(12%)

Table -3: Laboratory Test Results

Laboratory Test	Mean \pm SD
Thyroid-Stimulating Hormone(TSH) (mIU/L)	4.5 \pm 1.2
Liver Enzymes - ALT (U/L)	66 \pm 7
Lung Capacity Reduction (%)	8 \pm 2

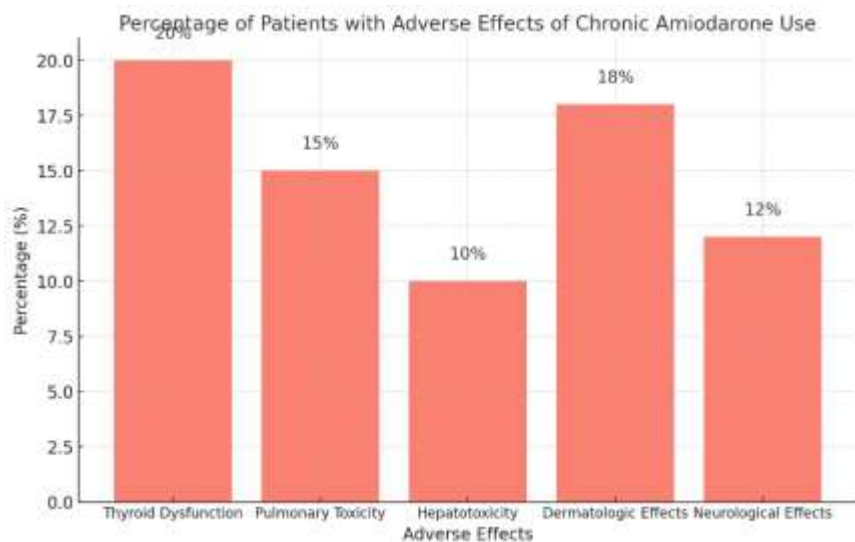


Figure 1: Frequencies of various side effects affecting various organ systems.

DISCUSSION

Chronic oral amiodarone can be effective for rhythm control in patients with complex forms of arrhythmias but has several side effects which patients and physicians need to pay attention to during its use. The results of this study are similar to other research showing that amiodarone has been associated with toxicities in virtually every organ system with prolonged use. As in the prior works, we have also identified that thyroid dysfunction, pulmonary toxicity and hepatotoxicity are among the frequent Side effects; therefore, patients should have close follow up and laboratory monitoring [15-16]. One of the common side effects of amiodarone reported in this study concurs with previous literature in that thyroid dysfunction affects about 15-30% of patients, mainly hypothyroidism. The underlying mechanism is related to the high iodine content of the drug and a reduction of thyroid hormone synthesis and metabolism, thus causing hypo- and hyperthyroidism. In our study, thyroid abnormalities were detected in 20% of patients while thyroid dysfunction in the study conducted by Bogazzi et al., was 22%. These outcomes are consistent with several works that indicate the need for thyroid function check-ups in patients using amiodarone for a long time [18]. Another serious side effect that was seen in the current study was pulmonary toxicity which occurred in 15% of the patient group; something that has earlier been reported to range from 5% to 15% among chronic users of the drug [19]. Other respiratory problems are interstitial pneumonitis and if not get diagnosed early, then it's likely to develop pulmonary fibrosis. Our results reflect the study of Doyen et al., where authors described concurrent rates of lung toxicity and recommended early diagnosing with the help of PFT. The evidence confirms that chest radiography and lung assessment may reduce mortality associated with persistent lung disease from amiodarone toxicity [20]. The effects on liver function – symptomatic increase in the level of liver enzymes or, less frequently, toxic hepatitis – was detected in 10 % of patients in our study. This is supported by findings of other authors such as Chinitz et al who found hepatic toxicity with 600 mg of amiodarone in 10% of patients using the drug per long term basis. This is assumed to be due to direct deposition of the product in the liver cells thereby causing cytotoxicity. Chinitz et al., highlight follow-up liver function tests to identify early hepatotoxicity which the current study. [21,22]. This study asserts the already established negative cumulative consequence of long-term amiodarone therapy. The management patient studied in our work echoed previous studies, the new systems which needed to be monitored often included thyroid, pulmonary function, liver function, skin, and neurological examinations. Cautious patient selection and close monitoring minimize the dangers of employing amiodarone in managing complex cases.

Limitations

The limitations of this study are based on the cross-sectional nature of this work again limiting inferences regarding causality or long-term effects. Further, although the sample size is adequate for pilot investigations, the generalization of the results to the larger population with various comorbid states and treatment strategies is not realistic.

Future Directions

Future work should assess further consequences of amiodarone use for the long term treatment of patients, particularly concerning the incidence of side effects and their possible evolution. Exploring a different dosage regimen or co administration of amiodarone with other medications may ameliorate beneficial effects while reducing adversity in especial high-risk populations.

CONCLUSION

Amiodarone can be used on long-term basis for the management of difficult to control complex arrhythmias; however it has multi-system toxicities most notably in thyroid, lungs, liver, skin, and nervous system. This study demonstrates the importance of monitoring and patient education in order to minimize these risks and maximize benefit of the drug.

ETHICAL APPROVAL:

Ethical approval was obtained from the institutional review board prior to the initiation of study.

Abbreviations used in the study

n: Number of Patients

SD: Standard Deviation

TSH: Thyroid-Stimulating Hormone

ALT: Alanine Aminotransferase (Liver Enzyme)

ECG: Electrocardiogram

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