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Editorial

Dr Abdulrazak Abyad

Chief Editor



In this first issue of the year we have a number of papers touching on important issues in elderly care including elderly abuse and aspiration pneumonia. I would like to wish all our readers, authors and production team a good start for the year.

A paper from Egypt tested the hypothesis that COPD is a risk factor for endothelial dysfunction in older men. The authors assessed endothelial dysfunction by measuring flow mediated dilation (FMD) of the brachial artery and by laboratory measurement of plasma fibrinogen level. Markers of endothelial dysfunction were found to have significant correlations with COPD severity and there was a statistically significant difference between cases and controls as regards markers of endothelial dysfunction in both current and ex-smokers. The authors concluded that COPD as a disease process or through the effect of smoking, is a risk factor for endothelial dysfunction in older men.

A case report from Saudi Arabia reported a case of nosocomial aspiration pneumonia. The patient was an 80-year-old male with co-morbidities which developed into aspiration pneumonia with all its complication. The authors stressed that this devastating yet easily avoidable complication of nosocomial aspiration pneumonia caused significant morbidity and mortality. He concludes it is a common cause of morbidity and mortality among debilitated and elderly patients and more emphasis should be laid on preventing this life threatening condition.

A descriptive cross sectional study from Iran looked at the factors associated with abuse in the elderly. The sample was drawn from ninety patients residing in Sadeghiyye charity nursing home in Isfahan. A direct relationship was observed between family relationships and abuse severity ($p = 0.02$) and an indirect relationship was observed between economic status and abuse severity ($p = 0.00$). The authors concluded that despite the rich Persian culture and the presence of persistent family relationships in Iran, intentional and non-intentional abuse in the elderly prevails. Therefore more realistic attention must be made towards this social dilemma and it should be included in health care programs.

Another case from Cairo reported on multifocal osteoblastoma as a rare cause of bony pains in a 60-year-old woman who is postmenopausal for nine years. An initial antero-posterior plain radiograph of the lumbar spine revealed lytic bone lesions in L3 and L4 lumbar vertebrae. Definite diagnosis as osteoblastoma was reached by cytological examination of CT guided needle bone biopsy from 4th lumbar vertebra. The patient received a two year course of intravenous infusion of bisphosphonates which was complicated by osteonecrosis of mandible. Clinical follow ups revealed increase in locations and intensity of pain with lower response to non steroidal anti-inflammatory drugs.

The effect of Ilioinguinal nerve block in addition to local infiltration on pain after inguinal hernia repair in the elderly

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ABSTRACT

Objective: The aim of this study is to determine the effect of ilioinguinal (IL) nerve block in addition to local infiltration on postoperative pain after inguinal hernia in the elderly.

Methods: In this study, sixty patients (ASA I-II aged 61-82) years, undergoing inguinal hernia under general anesthesia were included.

Patients were randomized into two groups. Group I (n=35), patients had local infiltration only, while Group II (N=35) patients received (IL) nerve block with 0.25% bupivacaine before skin incision, in addition to local infiltration.

Postoperatively patients received morphine according to pain scores. Twenty four hour morphine consumption and pain scores at 1, 4, 8, and 24 hours were recorded.

Results: Both pain scores and morphine used were significantly reduced in group II $P < 0.05$.

Conclusion: Ilioinguinal nerve block added to local infiltration can reduce pain and amount of morphine required after inguinal hernia.

Key Words: Anesthesia, ilioinguinal block, local infiltration, postoperative.

Introduction

Inguinal hernia repair and subsequent manipulation performed through inguinal incision may be associated with significant degree of pain in postoperative period. This pain can be relieved with opioid administration, however opioids are associated with several side effects, such as nausea, vomiting, sedation, pruritus and respiratory depression and may affect cognitive function in the elderly. To avoid these problems, physicians have used local anesthetics for postoperative pain relief. Pain after inguinal hernia could be managed in this way.

This pain has both somatic and visceral components. The somatic pain generated at the incision site and transmitted by the iliohypogastric (IH) and ilioinguinal (IL) nerves, which innervate the L1 - 2 dermatome distributions.

The clinical effect of the blockade of ilioinguinal, iliohypogastric was evaluated for hernia repair in some studies with encouraging results (1, 2, and 3).

The aim of this study was to evaluate if there is a difference in analgesia requirements and pain scores in elderly

patients undergoing inguinal hernia who received local infiltration with and without IL nerve blocks.

Methods and Patients

We studied sixty male patients undergoing elective inguinal hernia under general anesthesia in a double blinded, randomized trial. Patients were allocated randomly into two groups, group I (n=30) patients received local infiltration only, while group II (n=30) patients received IL nerve block and infiltration. Patients with hypersensitivity to bupivacaine have been excluded.

A standard anesthetic technique was used. Induction was achieved with fentanyl 0.5 micg/ kg, propofol

1-2mg/kg, atracurium 0.5 mg/kg; laryngeal mask airway was used for airway control. Anesthesia was maintained with 0.8 % Isoflurane and 66% N₂O in O₂.

Afterwards, all patients in group II received IL nerve injections using 10ml of 0.25% bupivacaine. In addition, both groups received a stepwise infiltration anaesthesia with bupivacaine 0.25% injected intra- and subcutaneously and sub facially and in the deeper layers during the operation (4).

All nerve blocks were performed by one anesthetist and all operations and infiltrations were performed by one primary surgeon. We used the following technique which was described by Katz for ilioinguinal nerve block: about 1 inch medial to the anterior superior iliac spine and on a line between the spine and the umbilicus, a 2 inch needle is inserted and after negative aspiration, 10 ml of local anesthetic is deposited as the needle pierces the fascias of the oblique muscles with fanwise and up and down infiltration (5).

Patients were treated postoperatively for pain in the same way. On evidence of pain, that is, if the pain score reached a value of 2-3 or more, patients received 5-10mg morphine i.m.. Pain was evaluated 1, 4, 8 and 24 hours after operation according to verbal scale 0=no pain, 1=discomfort, 2=mild pain, 3= moderate pain, 4= severe pain, 5= unbearable pain. The amount of morphine administered was recorded on 1, 4, 8, and 24 hour intervals as well. All data were analyzed by student's t-test.

Results

There were 35 patients in each group. Patients data (age, body weight and duration of surgery) were similar in both groups (P>0.05) (Table 1 - next page).

There were significant differences between group I and group II in verbal pain scores at all time of measurement (P<0.05).

The quantity of morphine administered per patient in 24hours was 30mg (range 10-45mg) in group I and 10mg (range 0-25mg) in group II (P<0.05).

Discussion

Our results indicate that IL nerve blockade in addition to local infiltration decreased the intensity of pain following inguinal hernia in comparison to infiltration alone. However, many patients reported to have pain and received morphine at most times during this study and that can be explained by the fact that while providing analgesia of the skin and deeper layers of the anterior abdominal wall, ilioinguinal nerve blockade would not provide analgesia for visceral pain which is diffuse with no peripheral nerve association. The results of the present study are in line with the results of several studies which showed that an ilioinguinal blockade may provide better postoperative pain relief following inguinal hernia repair in adults (6) and children (7)

compared with placebo. IL nerve blockade is a simple regional technique. The method is safe provided that the permitted maximum dose of local analgesic agent is not exceeded, and care is taken to ensure asepsis and avoidance of intravascular injection. In our study we have used minimal drugs and dosage of anesthetic agent. We have used very small dose fentanyl for induction, which could be achieved because of the opioids sparing effect of the local anesthetic, and using laryngeal mask airway for airway management IL nerve block provided a significant duration of analgesia. This is in keeping with the prolonged duration of action of bupivacaine (8).

In conclusion, our study demonstrated that ilioinguinal nerve block in addition to local infiltration improved the quality of postoperative analgesia after inguinal hernia repair and decreased opioid requirements.

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	Group I	Group II
Age (years)	71 ± 11	69 ± 12
Weight (kg)	72 ± 29	73 ± 31
Surgery (ma)	42 ± 22	45 ± 19

Table 1: Age, weight and duration of surgery of patients

	Group I	Group II
1 h	3.4 (1.6)	1.8 (1.2)
4 th h	3.7 (1.2)	2.0 (0.9)
8 th h	3.3 (1.1)	1.6 (1.2)
24 th h	2.7 (1.4)	0.9 (1.2)

Table 2: Mean (SD) pain scores for 2 groups

Chronic Obstructive Pulmonary Disease and Endothelial Dysfunction in Older Men

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ABSTRACT

Background: Chronic Obstructive Pulmonary Disease (COPD) is recognized as having multiple systemic consequences.

Aims: to test the hypothesis that COPD is a risk factor for endothelial dysfunction in older men.

Methods and Material: Assessment of endothelial dysfunction was done by measuring flow mediated dilation (FMD) of the brachial artery and by laboratorial measurement of plasma fibrinogen level. COPD cases were diagnosed according to pulmonary function tests and the COPD severity is classified using GOLD spirometric criteria.

Statistical analysis used: analyses were done for quantitative variables by using independent t-test in cases of two independent groups with parametric data and analysis was done for qualitative data by using Chi square test for independent variables. Correlations were done by using Pearson Correlation for numerical parametric data, and by using Spearman rho test for numerical non parametric data.

Results: Markers of endothelial dysfunction were found to have significant correlations with COPD severity and there was a statistically significant difference between cases and controls as regard markers of endothelial dysfunction in both current and ex-smokers.

Conclusions: COPD as a disease process or through the effect of smoking, is a risk factor for endothelial dysfunction in older men.

Keywords: Chronic Obstructive Pulmonary Disease; Endothelial Dysfunction; Older Men; Smoking.

Introduction

Globally, Chronic Obstructive Pulmonary Disease (COPD) is the fourth leading cause of mortality and the twelfth leading cause of disability [1]. In addition, COPD is a costly disease and is recognized as having multiple systemic consequences [2]. The systemic effects of the disease reflect the structural biochemical alterations occurring in the structures or organs other than the lungs in relation to the characteristics of the primary disease [3]. During exacerbations of COPD, a wide variety of systemic effects are seen including endothelial dysfunction [4].

The endothelium, the largest organ in the body, is strategically located between the wall of blood vessels and the blood stream. Endothelial dysfunction (ED) is characterized by a shift of the actions of the endothelium toward reduced vasodilatation, a proinflammatory state, and prothrombic properties and it is associated with most forms of cardiovascular disease such as hypertension, coronary artery disease, chronic heart failure, peripheral artery disease, diabetes and chronic renal failure [5]. The disorders of endothelial structures due to COPD may lead to vascular pathologies such as ischemic heart disease and stroke to occur more commonly in those with COPD [3]. The hypothesis that COPD is a risk factor for ED in older men was tested in this study. Exploration of this possible relationship between COPD and ED may affect the management plan of COPD older patients.

Subjects and Methods

A case control study was conducted on older males (> 60 years old). The sample size consisted of 100 males (50 cases and 50 matched controls). Cases were diagnosed according to pulmonary function tests and the COPD severity is classified using GOLD spirometric criteria [6]. Cases were recruited from Geriatrics and Gerontology department in Ain Shams University hospitals. Assessment of endothelial dysfunction was done by measuring flow mediated dilation (FMD) of the brachial artery and by laboratorial measurement of plasma fibrinogen level.

Measurement of FMD of Brachial Artery:

FMD, which is the measurement of transient changes in brachial artery diameter in response to shear stress, is measured as the percentage change in brachial artery diameter from baseline in response to the increased flow [7].

An increase in flow in the brachial artery is achieved by inflation of a pneumatic cuff (placed on the forearm, distal to the ultrasound imaging site) to suprasystolic pressure for 5 minutes.

On deflation of the cuff, the increased flow results in shear stress which activates endothelial nitric oxide synthase to release nitric oxide via the L-arginine pathway. The NO diffuses to the smooth muscle cells causing them to relax resulting in vasodilatation [7]. FMD measurement was done by the same well trained radiologist. Four critical elements of FMD methodology have been standardized:

1. The probe position in relation to cuff: the cuff was distal to the probe around the forearm, and the brachial artery was imaged above the ante-cubital fossa.
2. Shear stimulus or cuff occlusion time: there is a general consensus that 5 minutes is the optimum time to elicit a good reactive hyperemia response and consequent dilatation [8].
3. Image measurement: each image was measured at end diastole, and the maximal dilation was recorded rather than the dilation at any set time post cuff release.
4. Control of environmental factors: factors which are known to affect FMD measurements include room temperature, time of day and ingestion of fatty foods or caffeine [9].

Plasma Fibrinogen Measurement:

Maximum one part sodium citrate solution (0.11mol/L) was mixed with nine parts venous blood. The sample was centrifuged immediately at approximately 1500 x g for 10 minutes. Then the supernatant plasma was removed and stored at +15° to +25° until required for the test with maximum waiting time of 8 hours. Plasma fibrinogen was measured quantitatively by modified Clauss method in which citrated plasma is brought to coagulation with a large excess of thrombin. Normal fibrinogen level ranged from 1.8 to 3.6 grams per liter.

Older males with hypercholesterolemia by measurement and males having history of hypertension, coronary artery disease, diabetes mellitus, malignancy, other end organ failure, acute inflammatory disease (conditions which may affect fibrinogen level or FMD) were excluded.

Ethical considerations

Informed consent was taken from every older man participating in this study and the study methodology was reviewed and approved by the Research Review Board of the Geriatrics and Gerontology Department, Faculty of Medicine, Ain Shams University.

Statistical methods:

The collected data were coded, tabulated, revised and statistically analyzed using Statistical Package for Social Sciences (SPSS) program (version 17). Descriptive statistics were done using mean and standard deviation for numerical parametric data and by number and percentage for categorical data. Inferential analyses were done for quantitative variables by using independent t-test in cases of two independent groups with parametric data and analysis was done for qualitative data by using Chi square test for independent variables. Correlations were done using Pearson Correlation for numerical parametric data, and by using Spearman rho test for numerical non parametric data. The level of significance was taken at P value < 0.05.

Results

The age of cases ranged from 60 to 83 years and the mean age was 66.02 years old \pm 7.04 (SD). The age of controls ranged from 60 to 80 years and the mean age was 64.76 years old \pm 5.4 (SD). Table 1 shows the distribution of smoking parameters among cases and controls with a statistically significant difference in smoking pattern between cases and controls. The median duration of COPD diagnosis among cases was 10 years. Twelve percent of cases (6 cases) were diagnosed to have

Smoking Characters	Cases (50)	Controls (50)	Statistic	P value
Smoking status	Number	Percent		
• Current smokers	20 (40%)	26 (52%)	1.449 ^ϕ	0.23
• Ex-smokers	30 (60%)	24 (48%)		
Smokers parameters	Mean	SD	Statistic	P value
• Smoking index (Pack/year)	532.9 (308)	259.1 (176)	5.38 [#]	<0.001*
• Smoking duration in years	39.5 (12.7)	34.1 (12.9)	2.084 [#]	0.04*

Table 1: The Distribution of Smoking Characters among Cases and Controls

Markers of endothelial dysfunction	Cases (Mean±SD)	Controls (Mean±SD)	t value [#]	P value
Fibrinogen	3.76 (1.4)	2.65 (0.82)	4.863	<.001*
FMD Percent	8.27 (6.6)	15.2 (5)	5.891	<.001*

#Independent t-test

*Significant

Table 2: Comparison between Cases and Controls As Regards Markers of Endothelial Dysfunction

moderate COPD (stage 2) according to GOLD criteria (FEV1 >50% and less than 80%) thirty eight percent of cases (19 cases) had severe (stage 3) COPD (FEV1 >30% and less than 50%), fifty percent of cases (25 cases) had very severe (stage 4) COPD (FEV1 < 30%). [6]

The results of this study revealed that the mean fibrinogen level (a marker of endothelial dysfunction) is significantly higher in cases than controls and the mean FMD percent (a

marker of endothelial function) is significantly lower in cases (Table 2).

In this study, we demonstrated that COPD severity marked by FEV1 percent predicted has a significant positive correlation with fibrinogen level, and negative correlation with the percent of FMD (Table 3). Also, COPD duration was found to have a significant positive correlation with fibrinogen level (Table 3).

COPD severity	Fibrinogen		FMD%	
	r	p	r	p
FEV1 percent predicted	0.397†	<.001*	-0.574†	<.001*
Duration of COPD	0.353†	0.02*	-0.132†	0.4

† Spearman correlation ;

*Significant

Table 3: Correlation between COPD Severity and Markers of Endothelial Dysfunction

Smoking parameters	Fibrinogen Level		FMD Percent	
	r #	p	r #	p
Smoking index (Pack/year)	0.34#	<0.001*	-0.39#	<0.001*
Duration of smoking	0.23#	0.022*	-0.3#	0.002*

#Pearson correlation ;

*Significant

Table 4: Correlation between Smoking Parameters and Markers of Endothelial Dysfunction in the Whole Sample

The results of this study showed that smoking index (Pack/Year) has a significant positive correlation with fibrinogen level in the total sample (Table 4), with a statistically significant difference between cases and controls in both current and ex-smokers (Table 5). Also, in this study, we demonstrated that smoking index (Pack/Year) has a significant negative correlation with percent of FMD in total sample (Table 4), with a statistically significant difference between cases and controls in both current and ex-smokers (Table 5).

This study's results revealed that the duration of smoking has a significant positive correlation with fibrinogen level in the total sample (Table 4), with a statistically significant difference between cases and controls in both current and ex-smokers (Table 5). The results of this study also revealed that the duration of smoking has a significant negative correlation with percent of FMD in the total sample (Table 4), with a statistically significant difference between cases and controls in both current and ex-smokers (Table 5 next page).

Markers of endothelial dysfunction	Current smokers		ex-smokers	
	t value [#]	P value	t value [#]	P value
Fibrinogen level	2.755	0.011*	4.378	<0.001*
FMD percent	2.834	0.009*	5.943	<0.001*

#Independent t-test

*Significant

Table 5: Comparison between Cases and Controls As regard Markers of Endothelial Dysfunction in Different Smoking Status

Discussion

Chronic Obstructive Pulmonary Disease (COPD) is recognized as having multiple systemic consequences [2]. The hypotheses that COPD is a risk factor for ED in elderly men was tested in this case control study. Elevated plasma fibrinogen level and impaired FMD of brachial artery were taken as markers of endothelial dysfunction. Kidawa et al., 2003 reported that the degree of endothelial impairment correlates with plasma fibrinogen level in general population [10]. Also noninvasive brachial artery assessment of FMD has emerged as an important research tool for assessment of endothelial function [11]. FMD is the most widely used method for both small and large population studies of adults for assessment of endothelial function [12].

The result of this study confirms the rested hypothesis as it reveals that mean fibrinogen level is significantly higher in cases than in controls and mean FMD percent is significantly lower in cases. This result agrees with the result of another study which revealed that endothelial function (measured by FMD) was significantly impaired in COPD compared with controls. [13]. Patients with COPD showed a significantly lower level of endothelium-dependent dilatation (as measured by FMD) than did the controls and patients with severe COPD exhibited a more marked decrease in endothelium-dependent dilatation than did those with mild and moderate COPD [14]. During exacerbations of COPD, a wide variety of systemic effects are seen including ED, acute-phase protein elevation, triggering of the complement system, changes in adipokine concentrations, , and a shift of the haemostatic balance to promote coagulation [4].

A number of the biochemical markers that are associated with COPD are also associated with ED: In particular fibrinogen, complement, C-reactive protein, endothelin-1, interleukin 6, tumor necrosis factor- α and leptin [15]. The plasma fibrinogen level varies with the severity of the disease in patients with COPD [3].

Considering the fact, that most people who get COPD have been long-term smokers, in this study the markers of ED (plasma fibrinogen level and impaired FMD of brachial artery) were significantly positively correlated to smoking index in the total sample. It was reported that smoking, per se, can cause systemic inflammation and ED, even in passive smokers [16]. A number of factors may contribute to smoking-associated endothelial damage; smoking is associated with a direct toxic effect on human endothelial cells and reduces endothelial prostacyclin production. Smokers appear to be particularly susceptible to the activity of oxygen free radicals, and plasma indexes of lipid peroxidation are increased in smokers [17].

The statistically significant difference between cases and controls as regard markers of ED in both current and ex-smokers could be explained by the effect of COPD on the endothelial function or it may be due to the statistically significant difference as regards smoking parameters between cases and controls. In conclusion, Chronic Obstructive Pulmonary Disease (COPD) as a disease process or through the effect of smoking, is a risk factor for endothelial dysfunction (ED) in older men.

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Factors associated with abuse in the elderly

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ABSTRACT

Introduction

Improvement of health related factors and decreased mortality rate and increased life expectancy have caused the elderly population to increase. As the elderly are considered a vulnerable population and are the main users of health care services, they have concerns in this area. Elderly abuse is considered an issue related to long-term care programs. The aim of the present research was investigating elderly abuse and the related factors in the elderly residing in Sadeghiyye charity nursing home in Isfahan, Iran.

Materials and Methods

In the present descriptive (cross-sectional) research, the research population (n = 90) consisted of the elderly residing in Sadeghiyye charity nursing home in Isfahan, Iran who were at least 60 years old, and were selected using the randomized sampling method. The data collection tool was a questionnaire. The relation between demographic variables such as gender, educational level, etc and elderly abuse was investigated. The research environment was Sadeghiyye charity nursing home in Isfahan, Iran. The research objective was determining factors related to abuse in the elderly residing in a nursing home in Isfahan, Iran.

Results

The results obtained showed that 20% of the subjects were male and 80% of them were female. A direct relationship was observed between family relationships and abuse severity (p = 0.02) and an indirect relationship was observed between economic status and abuse severity (p = 0.00).

Conclusion

Regarding the growing population of the elderly in Iran and all over the world, greater attention should be given to this age group during social and cultural programming, especially since the elderly are considered a vulnerable population. In spite of the rich Persian culture and the presence of persistent family relationships in Iran, intentional and non-intentional abuse in the elderly prevails. The results of the present research revealed that 86.7% of the elderly suffered abuse. Therefore more realistic attention must be made towards this social dilemma and it should be included in health care programs.

Key words: elderly, abuse, abuse severity

Introduction

The elderly are considered a vulnerable population all over the world and need special attention in this regard. Improvement of health related factors and decreased mortality rate and increased life expectancy have caused the elderly population to increase in recent years, such that in every 10 people of the world, 1 is over 65 years old (1). At present, 33 million individuals over 65 years old are living in the United States, as compared to only 3 million in 1900. At the beginning of the 20th century, the average lifetime was only 47 years, which has now reached to 73 years and 79 years for men and women, respectively (2). In the middle of 2004, 10% of the world's population, i.e. 606 million individuals was at least 60 years old (3). It is anticipated that in 2025, the population of individuals 65 years old and over will reach 1.2 billion (4). The elderly population in Iran has also increased concurrently with the population growth; according to recent statistics, 7.8% of the Iranian population is at least 65 years old, which is anticipated to reach 16% in the next decades (1). Aging is associated with biological, metabolic, mental, and emotional changes and is considered as a natural, progressive, and irreversible phenomenon experienced by every individual. These changes are accompanied by alterations in health-related requirements (1). Increased lifetime, decreased poverty, and decreased morbidities as compared to the past, are all positive consequences, but only if the elderly can take advantage of them. Increased lifetime without enjoying life means that some proceedings have solved a problem but have worsened another (5). The contemporary elderly are very different from the ancient elderly, and the meaning of old age is far from what it used to be in the past (2). The significant increase in the world's elderly population has caused social concerns related to the elderly such as elderly abuse and long-term health care strategies (4). As the elderly are considered a vulnerable population and they are a predominant user of health care services, formulating and implementing appropriate health care programs are necessary for them (1). According to the research performed in this area, at present only 5% of individuals over 65 years old live in nursing homes, and only 15% of them live with their families and may receive care; therefore, 80% of them live independently, and it seems that 82% of these independent elderly are completely or partially healthy (2). In addition, a centralized investigation performed on requirements of the elderly in 2000 revealed that 9.33% of the Taiwanese elderly required home-care, and about 90% of all the dependent elderly receive the required health care services (4). Increased elderly population is associated with increased abuse rates in the elderly. Elderly abuse significantly increases the probability of death in them. Many elderly don't have their own rights; therefore, many cases of elderly abuse remain unrecognized (6). Negative and stereotyped understanding of aging and the elderly seems to be decreasing, but cases of elderly discrimination could still be seen and requires attention. The elderly increasingly constitute a higher proportion of the population, and therefore they have important implications on policies, economy, and the social and dynamic aspects of their families. Although favorable changes have occurred, many elderly individuals are still vulnerable to financial, emotional, and physical abuse (7). As elderly abuse has many different forms, defining elderly abuse is a difficult task. One definition may be as follows: a disturbing behavior or even the absence

of appropriate treating in a relation based on trust and honor that has occurred once or more, and has resulted in distress and harm for the elderly (8). In another definition, elderly abuse is defined as intentional actions leading to harm or to the risk of serious injury in an elderly individual (whether or not the abuser intends to cause an injury). A vulnerable elderly person can be injured by a care-giver or other individuals having close relationships with him/her; and even neglect in the area of fulfilling the essential needs of the elderly or in the area of protecting the elderly, is regarded as abuse (9). Physical abuse, persistent verbal assault, psychological abuse, sexual abuse, deprivation of help required for daily life, deprivation of therapeutic drugs, forced isolation, and financial abuse are the 8 types of elderly abuse (10). Elderly abuse, regardless of the type, is often hidden, especially psychological abuse (4); in other words, as both the abuser and the abused elderly tend to hide or even deny abuse, the incidence and prevalence rates of elderly abuse are often difficult to determine, and the prevalence rate of elderly abuse has been studied in only a few countries (11). Generally speaking, statistical data regarding elderly abuse is highly variable among different countries, and the WHO reports the incidence rate of elderly abuse to be 4-6% in Europe (4). An important issue in this regard is that comparing the statistical data between different nations should be performed with much caution, since different countries have different definitions for elderly abuse (11). During the past 20 years, general awareness and alertness regarding the complications of elderly abuse has increased; in addition, screening devices and the methods for identifying, investigating, and treating the elderly being abused or at risk of being abused have improved. Yet there is general agreement that all the cases of elderly abuse have not been identified. Although all types of abuse are not intentional, even non-intentional abuse is detrimental for the elderly, and it is seen when there is a lack of sufficient knowledge, ability, or resources required for taking care of the beloved elderly.

A spouse or an offspring of the elderly often takes care of him/her, who himself/herself may be an elderly lacking the required physical abilities for providing the strenuous health care services. In cases where the elderly suffers confusion or requires persistent care, the probability of abuse increases (9). Regarding the important role of the elderly as a vulnerable social group and the increasing population of them, and also regarding the possible role of a nurse in revelation of elderly abuse and in increasing the awareness of the elderly, we were encouraged to investigate the severity of elderly abuse in a charity nursing home in Isfahan, Iran, because using statistical data in this regard may aid us in paying more knowledgeable attention to this issue and thus promoting the health care systems of our society.

Materials and Methods

In the present descriptive (cross-sectional) research, the research population (n = 90) consisted of the elderly residing in Sadeghiyye charity nursing home in Isfahan, Iran who were 60-91 years old, and were selected using the randomized sampling method and participated in an interview. The exclusion criteria included predetermined mental disorder (schizophrenia, Alzheimer's disease, major depression, etc.) preventing

the subject from answering the questions logically; organic disease such as severe hearing loss; age < 60 years old; and the subject refraining from answering the interview questions.

The data collection tool was a questionnaire consisting of 18 questions: 7 questions pertaining to demographic characteristics (including the subjects' age, gender, marital status, number of offspring, educational level, duration of residence in nursing home, and previous living situation); 1 question pertaining to economic status; 1 question pertaining to family relationships; 6 questions pertaining to abuse and misconduct (verbal, psychological, physical, and neglect); 2 questions pertaining to the effect of other people's behavior on the mental functioning of the elderly subject (the subject's perception regarding life and old age); and 1 question pertaining to the organic diseases of the elderly subject (cardiovascular, respiratory, gastrointestinal, neurological, psychiatric, rheumatologic, and renal diseases, and also diabetes and hypertension). The questions were first rendered to the chief executive of the nursing home, and were evaluated and approved. On average, 20 minutes was spent for completing each questionnaire. The interview method was as follows: the interviewer first introduced herself to the elderly subject and after establishing the required communication, she described the objective of the research and stated that in order to keep the subjects' confidentiality, the questionnaires were anonymous. After gaining the subjects' consent to answer the questions, they were asked one by one from the elderly subject. Abuse severity was measured by asking yes/no questions pertaining to abuse: subjects who didn't answer "yes" to any questions didn't suffer abuse; those who answered "yes" to one question suffered mild abuse; those who answered "yes" to two questions suffered moderate abuse; and those who answered "yes" to all three questions suffered severe abuse. In the present research, only verbal assault, physical abuse, and psychological abuse (neglect) were investigated among the different types of abuse.

Descriptive statistical methods were used for data analysis, and the qualitative Chi-square test was used for determining the demographic characteristics and abuse severity. The correlation test was used for variables showing statistically significant differences.

Results

The results obtained showed that 20% of the subjects were male and 80% of them were female; 47.8% of them were under 70 years old and 2.3% of them were over 90 years old. The mean age of the subjects was 72.3 ± 9.92 years.

Regarding marital status, 22.2% of them were single, 4.4% were married, 13.3% were divorced, and 60% were widowed.

Regarding educational level, 66.7% of the subjects were illiterate, and 33.3% of them were literate.

Regarding the number of offspring, 47.8% had no children, 52.2% had children, and the mean offspring number was 1.9 ± 1.5 .

The mean duration of residency in the nursing home was 2.5 ± 0.76 years among the research population. 44.4% of the subjects lived alone before coming to the nursing home.

Regarding economic status, 22.2% of the subjects were independent, 25.6% were partly dependent on others, and 52.2% were completely dependent on others.

According to the subjects' own view, 33.3% of them experienced mutual respect and friendship in their family relationships, 10% experienced high respect towards the elderly, and 56.7% experienced loosened family relationships.

30% of the elderly perceived old age as debilitation; 26.7% of them felt they were disturbing others, and only 8.9% of them believed they were useful in life.

58.9% of the subjects stated they had experienced verbal assault on at least one occasion, 12.2%, 13.3%, 10%, 13.3%, and 11.1% of which was performed by the spouse, the children, the son or daughter in law, the relatives, and the staff, respectively.

32.2% of the subjects stated they had experienced physical assault on at least one occasion, 8.9%, 7.8%, 2.2%, 7.8%, and 4.4% of which was performed by the spouse, the children, the son or daughter in law, the relatives, and the staff, respectively.

82.2% of the subjects stated they had experienced neglect, 7.8%, 30%, 4.4%, 28.9%, and 10% of which was performed by the spouse, the children, the son or daughter in law, the relatives, and the staff, respectively.

Regarding the incidence rate of diseases among the elderly in the research population, 15.6% didn't suffer any diseases, and 11.1%, 2.2%, 8.9%, 11.1%, 15.6%, 6.7%, 2.2%, 8.9%, and 17.8% suffered cardiovascular diseases, respiratory diseases, gastrointestinal diseases, rheumatologic diseases, neurological diseases, psychiatric diseases, renal diseases, diabetes, and hypertension, respectively.

Discussion and Conclusion

According to demographic investigations, the prevalence rate of elderly abuse is approximately 1-10% in the United States and the Western countries. In a random population-based study performed on the elderly, it was found that 8-16% of them had experienced abuse (mainly neglect, psychological abuse, and financial abuse) on at least one occasion during the previous years.

However, physicians and health professionals believe that the real prevalence is essentially higher than reported (9). In addition, in research performed in 1993 on 2000 adults, it was found that 5.3% and 1.5% of the research population had experienced verbal abuse and physical/financial abuse, respectively (11). The results also showed that only 14% of the elderly population of the research had experienced neither kinds of

Severe abuse	Number	Percent
Low	12	13.3
Mild	24	26.7
Moderate	30	33.3
Severe	24	26.7
Total	90	100

Table 1: Frequency distribution of severity in elderly abuse case study

Variables	Correlation coefficient	p-value
Relations, and severe abuse	0/649	00/0
Financial situation and severity of abuse	0/259	0/02

Table 2: Correlation coefficient between two variables and severity of abuse and family financial situation

abuse (physical, verbal, and neglect). In the Second Congress on Investigating Elderly Issues in Iran, Talakuei, Mahnaz stated that 472813 reports on ethnic/family-related abuse in the elderly was received in 2000, only 8.3% of which were performed in charity institutions. The elderly experiencing physical or mental abuse suffer depression and mental disturbances. Inability in self-care, social isolation, and self-neglect are the most important complications of elderly abuse and neglect. Elderly women are prone to all types of abuse except being abandoned, 75% of whom experience physical abuse and 92% experience financial abuse (6). In this study, no statistically significant difference was observed between men (83.3%) and women (87.5%). Intentional abuse is performed mainly in families with a positive history of social or behavioral dilemmas. Families with positive history of dilemmas such as violence, substance abuse, serious financial problems, and unemployment are called families at risk for abuse (7). A direct relationship was observed between family relationships and abuse severity in the present study; as seen in Table 2, the correlation coefficient between family relationships and abuse was 0.649 ($p = 0.00$). In another study titled "The prevalence of verbal and physical violent behavior in Canada" performed in 2005 by Weber et al. in Canada and on 2332 subjects, 21% and 11.2% of the subjects had experienced verbal violent behavior and both types of abuse, respectively. In the present study, 58.9% and 32.2% of the subjects had experienced verbal assault and physical violence, respectively. The correlation test revealed a direct relationship between family relationships and abuse severity ($p = 0.02$) and an indirect relationship between financial dependence and abuse severity ($p = 0.00$); in other words, the lower the financial dependence, the more severe the abuse. This means that the elderly with better economic status reported more abuse.

Regarding abuse severity and marital status, the abuse rate was 85% in the single, 100% in the married, 91.6% in the divorced, and 85.1% in the widowed subjects.

Regarding abuse severity and financial status, the abuse rate was 100% in the independent, 91.3% in the partially dependent, and 87.7% in the completely dependent subjects.

Regarding abuse severity and previous care-givers, the abuse rate was 100% in those who lived with their spouse, 100% in those who lived with their spouse and children, 84.2% in those who lived with their children, 83.3% in those who lived with their relatives, and 85.1% in those who lived alone ($p = 0.5$). In another study, it was stated that most cases of abuse suffered by the elderly was performed by those who were directly responsible for care-giving, mainly the close family members, such that 40% of abuse cases were performed by a spouse or the children, and 50% by the eldest child (11).

Regarding abuse severity and educational status, the abuse rate was 85% in the illiterate subjects, 95% in the literate subjects, 75% in the subjects who had graduated at 8th grade, 0% in the subjects who had graduated high school, and 100% in the subjects with a university educational level.

Regarding abuse severity and previous relationships, the abuse rate was 66.6% in those who experienced mutual respect and friendship, 77.7% in those who experienced high respect towards the elderly, and 100% in those who experienced loosened family relationships; the correlation was statistically significant ($p = 0.00$).

Regarding the statistical results obtained in this research (as a small sample of the elderly population), we believe that the nurses and health professionals - as care givers providing services at home, nursing homes, or even hospitals - should search to identify the elderly suffering any type of abuse by family members or other health professionals. In addition

it is the responsibility of health care providers to familiarize the elderly with their rights, to educate them, and to encourage them to discuss their problems with the related authorities and not to conceal these problems. Also, the mass media (as readily accessible and influential devices) should make proceedings for the revelation and disclosure of this social dilemma.

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Follow Up Case Study: A 60-year-old Woman with Multifocal Osteoblastoma

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ABSTRACT

A 60-year-old woman who is postmenopausal for nine years, presented eight years ago with mild low back pain, dull aches relieved temporarily by non steroidal anti-inflammatory drugs and with no history of trauma or loss of weight. An initial antero-posterior plain radiograph of the lumbar spine revealed lytic bone lesions in L3 and L4 lumbar vertebrae. Radiological differential diagnosis includes different pathologies. Definite diagnosis as osteoblastoma was reached by cytological examination of CT guided needle bone biopsy from the 4th lumbar vertebra. The patient received a two years course of intravenous infusion of bisphosphonates which was complicated by osteonecrosis of mandible. Clinical follow ups revealed increase in locations and intensity of pain with lower response to non steroidal anti-inflammatory drugs. Radiological follow ups showed stationary course of spine lesions and likely involvement of the 6th and 8th ribs and head of right humerus.

Conclusion: a case presentation of Multifocal Osteoblastoma (as a rare cause of bony pains) in adult female: Follow Up Study.

Case presentation

A 60-year-old woman with no especial habits of medical importance, had positive history of hypertension (on angiotensin converting enzyme inhibitor [ACEi]) and bilateral knee osteoarthritis (on occasional use of oral non steroidal anti-inflammatory drugs [NSAIDs]), presented 8 years ago for screening of bone mineral density (BMD). Although she had normal BMD of lumbar spine by dual energy absorptiometry scan, the image of 3rd (L3) and 4th (L4) lumbar vertebrae was distorted. The patient reported mild low back pain, and dull aches relieved temporarily by NSAIDs. There was no history of trauma or loss of weight. She was postmenopausal for one year after total hysterectomy for invasive villi and moderate atypical trophoblastic proliferation but no malignancy.

An initial antero-posterior plain radiograph of the lumbar spine revealed lytic bone lesions in L3 and L4.

Tc99m bone scan revealed abnormal increase in tracer uptake in L3 and L4 vertebrae and also in multiple dorsal vertebrae.

Magnetic resonance imaging (MRI) of the whole spine with gadolinium showed in sagittal series, a cystic like lesion with rim enhancement in left side of D8, almost total collapse of body of D9 with enhancing solid lesion in its posterior part and marrow replacement lesion in L3 and L4 with more collapse in body of L3. Axial images showed marrow replacement cystic lesion in left half of body of D8 surrounded by a sclerotic margin. A totally collapsed D9 also had a sclerotic margin. There was diffuse sclerosis of partially collapsed vertebral body of L3. There was marrow replacement lesion of left half of L4 vertebral body, left transverse process and pedicle which appeared expanded. The affected portion showed predominantly sclerotic texture with mild enhancement (Figures 1, 2 - next page). There was no evidence of vertebral lesion of abnormal signal intensity or abnormal enhancement at cervical spine. Regarding the laboratory investigation, except for elevated sedimentation rate (70 at 1st hour), high LDH (978 iu/L), elevated alkaline phosphatase (261 in/L) and mild normocytic anemia, all laboratory results were within normal limits.

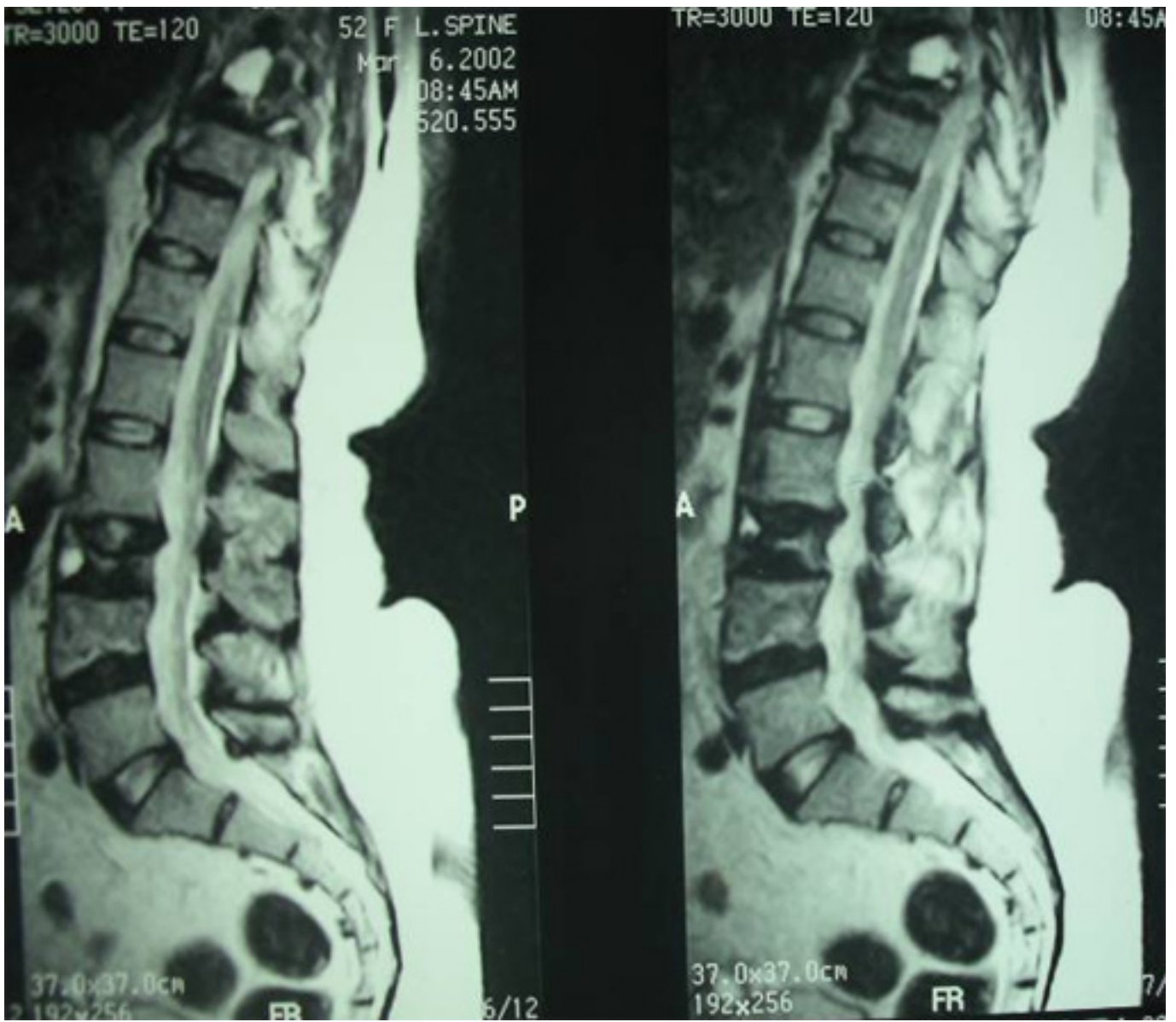


Figure 1: MRI (T2 sagittal images) shows: Almost total collapse of body of D9 with enhancing solid lesion, marrow replacement lesion in L3 with partial collapse in body of L3 and marrow replacement lesion in L4.

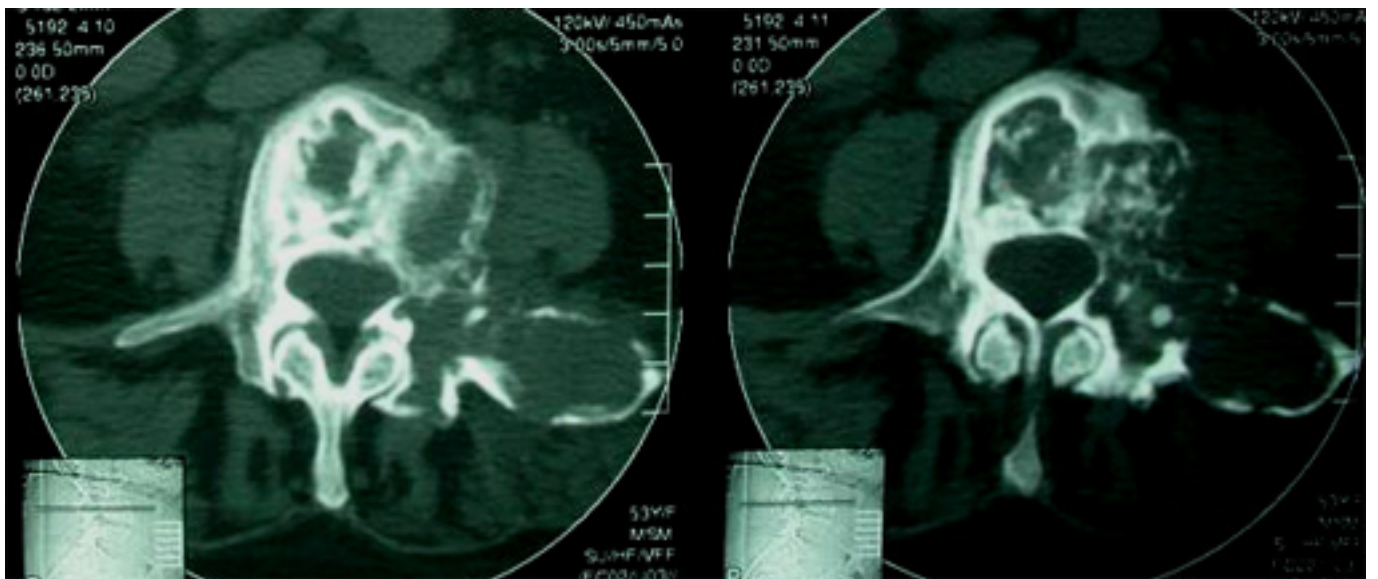


Figure 2: CT cuts show: lesions appeared as mixed predominantly osteolytic and osteosclerotic areas with evident cortical disruption

Radiological Differential Diagnosis

1- Multiple Bone Metastasis of Unknown Primary Tumor:

Tumor induced bone destruction can complicate any neoplasm with breast carcinoma, myeloma and lung carcinoma being the most common site metastasizing to bone in females.(1) MRI is extremely sensitive to the detection of metastasis in the vertebral bodies. The multiplicity of lesions is strong evidence for a metastatic origin. On MRI, metastatic lesions are generally of low intensity on unenhanced T1-weighted images. Rarely, metastatic lesions are hemorrhagic and appear of high signal intensity on T1-weighted images. On T2-weighted images, they have a varied appearance and may be hypointense, isointense, or hyperintense.(2)

2- Plasma Cell Myeloma: is a monoclonal proliferation of malignant plasma cells that affects the bone marrow. The peak incidence is in the 6th decade. The spine is the most common site and epidural involvement is frequent. MRI in early myeloma may reveal marrow involvement in both symptomatic and asymptomatic patients.(3)

3- Giant Cell Tumor: This tumor can produce metastasis, although it is cytologically benign. It occurs more frequently in women during the 3rd and 4th decades of life.(1) On MRI it is seen as a mixed signal, multi-compartmental cystic mass that frequently contains blood degradation products. A hypointense rim around the lesion on T2-weighted image suggests less aggressive nature of the tumor.(4)

4- Fibrous Dysplasia: is a non-inherited developmental disorder in which normal bone marrow is replaced by fibro-osseous tissue. It is often asymptomatic and frequently incidentally detected on radiographs taken for unrelated clinical indications. However, it may be complicated by pathological fracture and, rarely, by malignant degeneration. It is typically seen in adolescents and young adults.(5) On MRI, most of the lesions are largely isointense to skeletal muscle on T1 weighted images. On T2 weighted images, lesions are typically heterogeneously hyperintense with hypointense, isointense or markedly hyperintense areas within. Depending on the appearance on both the T1 and T2 weighted images, the heterogeneous areas may be due to calcification, cystic changes or fatty areas.(6)

5- Non-Ossifying Fibroma (NOF) or fibroxanthoma: is the most common type of benign fibrous bone lesion and it is considered as fibrous cortical defect when smaller than 3 cm in size.(7) The appearance of NOF on MRI is hypointense to skeletal muscle on T1-weighted images; it is often more hypointense than hyperintense on T2-weighted images, and is often associated with avid contrast enhancement.(8)

6- Aneurysmal Bone Cysts: The cysts have a high propensity for the spine. Spinal localization represents approximately 30% of this type of tumor, occurring principally in adolescents and young adults.(1) MRI typically shows a well-circumscribed, macrolobulated cystic lesion, often containing multiple fluid-fluid levels, which correlate with the histological finding of large blood-filled spaces without endothelial lining. The finding of fluid-fluid levels is nonspecific, however, and can be seen with other osseous lesions.(9)

7- Vertebral Hemangioma (VH): is the most common benign spinal neoplasm. Peak incidence is in the fourth to sixth decades. Asymptomatic hemangiomas occur equally in both men and women but there is female predominance in symptomatic hemangiomas. About 60% of VHs are asymptomatic lesions which are discovered incidentally on imaging.(10) On MRI, vertebral haemangiomas are seen as round, well delineated vertebral body lesions which are high signal intensity on both T1 and T2 weighted sequences. Some of them are predominantly low signal on T1 weighted images. These lesions often enhance following contrast administration. Histologically, these lesions contain predominantly vascular rather than fatty stroma.(11)

8- Multifocal Osteoblastoma: Osteoblastoma is a rare benign bone forming tumor. It accounts for approximately 1% of all primary bone tumors and 3% of all benign bone lesions.(12) In general, primary bone tumors of the spine are rare, often unsuspected, and misdiagnosed, or late diagnosis is an unfortunate reality in many cases.(1) This benign, osseous tumor occurs most commonly in adolescents and adults in their second or third decades and the male/ female ratio is about 2:1.(13) The lesion has a predilection for the axial skeleton, which accounts for 40% of the reported cases.(14) It commonly tends to involve the posterior components of vertebra including the pedicle in most cases, in contrast to other benign tumors, which often involve the vertebral body.(15) Osteoblastoma commonly present with a long history of dull, aching pain, often at rest and occasionally the tumor is painless.(16) Spinal lesions may present with neurologic symptoms as a result of mechanical compression, as well as scoliosis.(17) Spinal osteoblastoma are more apt to behave in an aggressive manner with cortical destruction as well as extend into neighboring soft tissues, a fact not seen as often in its long bone variant.(18) While malignant transformation of osteoblastomas is rare, they can be aggressive and have a high rate of recurrence following treatment.(19) On MRI, they show intermediate signal intensity on T2- weighted image with mixed high signal foci on T2 - weighted image and a wide band of reactive sclerosis.(20)

Clinical Diagnoses

? Multiple Bone Metastasis of Unknown Primary Tumor

? Multifocal Osteoblastoma

Radiological Workup:

Plevi-abdominal ultrasound and computed tomography (CT) shows three cystic focal lesions in the liver; the largest was 2 cm in diameter at the posterior segment of right lobe and a smaller cyst at right kidney.

CT chest axial cuts with intravenous contrast showed normal study. Breast imaging showed bilateral normal mammographic and sonographic examination. Thyroid ultrasonography showed left lobe solid nodule in its lower half measuring 1 x 0.8 cm with increased peri-lesional flow as evidenced by color Doppler interrogation. Tc 99m thyroid scan showed enlarged both thyroid lobes with decreased homogenous tracer uptake with no apparent nodules.

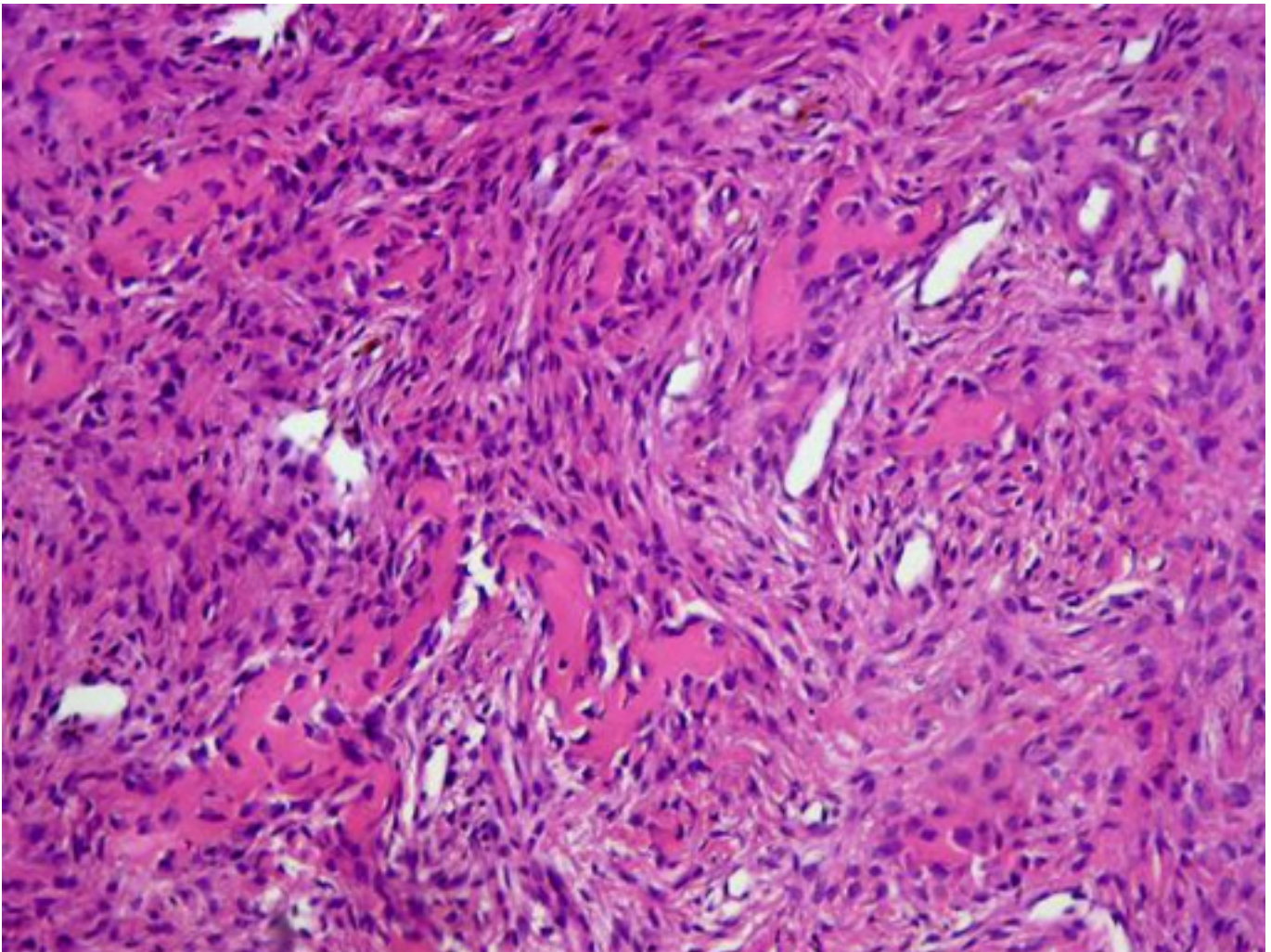


Figure 3: Osteo tissue rimmed by osteoblasts set in a cellular vascular-rich stroma

Laboratory Workup:

Thyroid function tests were within normal limits, serum protein electrophoresis showed hyper gamma globulins. Bone marrow aspirate showed no evidence of malignancy.

Apart from Cancer antigen 19.9 which was slightly elevated 85.5 U/ml (normal up to 37), Carcinoembryonic antigen, Alpha-fetoprotein, Cancer antigen 15.3 and Cancer antigen 125 were within normal limits.

Pathological Discussion:

Diagnosis of osteoblastoma by fine-needle aspiration is rare, as in most patients, excision biopsy is performed.(21) The uncommon presentation of osteoblastoma in an older female with multifocal affection encouraged the decision to take a CT guided needle bone biopsy. The biopsy was taken from the left pedicle of 4th lumbar vertebra (L-4). The procedure is complicated by mild increase of the size of left transverse process as well as the expansile osteolytic lesion at the left pedicle of L4 vertebra. Cytology report showed features of a benign osteoblastic growth consisting of areas and trabeculae of osteoid tissue focally calcified. A cellular component predominates composed of spindle and ovoid cells with bland nuclei. Scattered giant cells are seen. Focal hemorrhage is seen but no necrosis.

Features of Osteoblastoma (Figure 3)

Although osteoblastoma has clinical and histological manifestations similar to those of osteoid osteoma, it differs in its ability to grow larger than 2.0 cm in diameter (22) and absence of peripheral sclerotic bone. (1) Osteoblastomas can exhibit areas resembling aneurismal bone cyst, which are not found in osteoid osteomas.(23) Osteoblastomas often extend to extra-skeletal soft tissue structures, and recur more frequently after surgery and even metastasize.(17,24)

Discussion of Management:

Due to multiplicity of the lesions in the vertebral column and absence of symptoms and complications apart from mild low back pain, a decision to postpone the surgical treatment was taken. The patient was closely followed every 3 months during the 1st two years and every 6 months for 3 years and every year after that. Follow ups were done by clinical, laboratory and radiological assessment. A 24 months course of bisphosphonates (Zoledronic acid 4 mg) infused intravenously over 15 minutes every month, was taken during the 1st two years of follow up. Bisphosphonates are suggested to be useful co-analgesics for treatment of moderate to severe metastatic bone pain and zoledronic acid has a superior efficacy.(1) At the end of the course the patient complained of asymptomatic separation of two pieces of bone from the mandible following

a tooth extraction; the largest was 0.4 cm in diameter. The separated bone was necrotic with marrow fibrosis; a picture that is resembling osteonecrosis of mandible which is a rare complication of bisphosphonates therapy.(25) Repeated follow up MRI dorso-lumbar spine showed stationary course except for decrease in size of the cystic like component at the tip of left transverse process with replacement by a soft tissue component but no newly developed lesions. Follow up Tc99m bone scan revealed stationary course of all previously noted osseous lesions with no new lesions depicted. Four years after treatment course, follow up Tc99m bone scan showed two new foci developed at medial posterior segment of right 6th and 8th ribs. Ten months ago, the patient was complaining of right shoulder pain increasing in intensity, more at night, and it responded less to anti-inflammatory drugs. MRI of right shoulder joint showed mild acromio-clavicular osteoarthritis, supraspinatus tendinopathy, and mild joint effusion with subcoracoid and to lesser extent, subacromial, as well as subdeltoid bursitis. It also showed small humeral head benign looking lesion at antero-medial aspect measuring 1 x 0.5 cm with no evidence of interruption of the overlying cortex. Two tiny bone cysts are seen at the humeral head eliciting low T1 and bright T2 signal.

Conclusion: a case presentation of Multifocal Osteoblastoma (as a rare cause of bony pains) in adult female: Follow Up Study.

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Nosocomial Aspiration Pneumonia: Case Report and review of literature

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ABSTRACT

An 80-year-old male with co-morbidities of diabetes, Parkinson's disease, hypertension, and osteoarthritis was admitted with polyphagia, polydipsia, fever and cough with sputum. His examination was significant for occasional coarse crepitations at left lung base and his laboratory results showed uncontrolled hyperglycemia, leucocytosis and metabolic acidosis with presence of urinary ketones. Thus he was diagnosed as diabetic ketoacidosis precipitated by left lower lobe pneumonia and managed accordingly till the day of his discharge when he suddenly became unresponsive during feeding and was intubated and shifted to intensive care. Ensuing chest x-ray showed a new right middle lobe homogeneous opacity, consistent with right sided aspiration pneumonia. The patient was treated and finally weaned off ventilator on nasogastric tube feeding when again in the general ward the patient vomited and became unresponsive and was found to have aspiration pneumonia in the left middle lobe and was shifted back to ventilatory support. This devastating yet easily avoidable complication of nosocomial aspiration pneumonia caused significant morbidity not only to this patient with additional burden on hospital expenditure, but was also responsible for 44% of fatalities in the general medical wards in the prior months. Aspiration events are a common cause of morbidity and mortality among debilitated and elderly patients and more emphasis should be laid on preventing this life threatening complication by employing better evaluation techniques to quantify the risk of aspiration and implementing proper preventative strategies in high risk patients to help avoid nosocomial aspiration pneumonia.

Background

Aspiration Pneumonia (AP) is the leading cause of death among nursing home patients and also accounts for approximately 10% of community-acquired pneumonia cases.(1) AP has an incidence of approximately 30% in the nursing home population.(2) The Relative risk for pneumonia is highest in patients with neurological deficit like stroke or dementia.(3) Forceful coughing, active ciliary transport, and normal immune response are presumed to be protective against acquiring aspiration pneumonia and loss of any of these is considered as a risk for developing AP.(4,5)

Here we attempt to describe this common yet serious cause of fatality among the geriatric or bedridden population and review the preventative strategies to avert nosocomial aspiration pneumonia.

Case Report

In January 2009, an 80-year-old Saudi male, known diabetic for 15 years on insulin, with co-morbidities of Parkinson's disease, hypertension, and osteoarthritis, on medications, was admitted to an Armed Forces Hospital via emergency with the symptoms of polyphagia, polydipsia, fever and cough productive of yellowish sputum for the last 3 days. On examination he was febrile with a temperature of 38.0°C, blood pressure of 148/92, tachypnoea of 26 breaths/minute and pulse of 98/minute. General physical examination revealed only mild pallor and pill rolling tremors. Chest examination showed only mild coarse crepitations over the left lower lung zone but no typical bronchial breathing. Lead pipe rigidity and resting tremors were the only findings in the central nervous system. Examination of all other systems was negative. His laboratory reports showed uncontrolled hyperglycemia of 26 mmol/dl with metabolic acidosis having with bicarbonate of 16.2 and leucocytosis



Figure 1: Chest x-ray of the patient showing right lower lobe aspiration pneumonia

WBC	13.2	pH	7.27
Hb gm/dl	14.3	pCO ₂ KPa	5.2
Blood glucose mmol	25.6	pO ₂ KPa	8.9
Alanine aminotransferase IU/L	35	HCO ₃ mmol/L	16.2
Aspartate aminotransferase IU/L	41	Anion gap	25.4
Bilirubin mmol/L	16	Urea mmol/L	8.1
Alkaline phosphatase IU/L	108	Creatinine mmol/L	109

All units are standard SI units

Table 1: Laboratory Data of the Patient on Admission

of 14.1 (See Table 1, for laboratory data). Urine for ketones was +1 and chest x-ray showed small left lower lung lobe infiltrates. A diagnosis of diabetic ketoacidosis precipitated by pneumonia was made and he was treated with insulin infusion, IV fluids and antibiotics. During the course of hospital stay he also developed malena, and was scoped and found to have erosive gastritis and was treated accordingly. The patient was recovering very well and getting ready for discharge when one morning, while getting breakfast, he became unresponsive and Code Blue was activated. The examination of the patient at that time revealed food material over neck and shirt and gurgling sound all over the right side of the chest. The patient was then intubated and shifted to ICU. The sub-

sequent chest x-ray showed a right middle lobe homogenous opacity consistent with right sided aspiration pneumonia. (See Figure 1) The patient was treated with antibiotics and supportive therapy and finally shifted back from the intensive care unit to the male medical ward. Two days later even on NG tube feeding getting continuous feeding of 120 ml per hour for 19 hours a day, the patient again vomited and became unresponsive and this time developing another aspiration pneumonia proven by chest x-ray and was again shifted back to ventilatory support. The patient unfortunately is still in ICU 20th day post-intubation which speaks volumes of the hospital cost that has incurred due to this devastating event of aspiration.

Altered consciousness

Alcoholism, seizures, cerebrovascular accident, head trauma, general anesthesia, drug overdose

Dysphagia

Esophageal disorders including stricture, neoplasm, diverticula, tracheoesophageal fistula, incompetent cardiac sphincter

Neurologic disorder

Multiple sclerosis, Parkinson disease, myasthenia gravis, pseudobulbar palsy

Mechanical disruption of the usual defense barriers

Nasogastric tube, endotracheal intubation, tracheostomy, upper gastrointestinal endoscopy, bronchoscopy

Other

Protracted vomiting, gastric outlet obstruction, large-volume nasogastric tube feedings, pharyngeal anesthesia, general debility, recumbent position

Table 2: Conditions that predispose to Aspiration Pneumonia

Review of literature

Introduction

Aspiration pneumonia is defined as the development of pneumonia after the misdirection of colonized oro- and naso-pharyngeal contents, endogenous secretions or exogenous particulate materials into the lower respiratory tree in a patient who is at risk of aspirating; (See Table 2 for Risk factors for Aspiration Pneumonia). Chest x-ray shows consolidation in affected lobe depending on the position of the patient during the aspiration, commonly in right middle and lower lobes.

The clinical features associated with aspiration pneumonia include tachypnoea, cough, and other signs of pneumonia while laboratory tests may reveal a leukocytosis consistent with infection and electrolyte abnormalities consistent with dehydration. The diagnosis of aspiration pneumonia is established based on clinical suspicion of aspiration accompanied by an infiltrate on chest x-ray.

Preventive Measures against aspiration pneumonia

1. Identifying population at high risk for aspiration:

The most reliable yet cumbersome procedure for detecting swallowing disturbances is video fluoroscopy. Plain x-ray and scintigraphy is also helpful in this regard. However the following bedside tests can reliably predict aspiration risk,

- Today Procedure; for a conscious patient in face up position nasogastric tube only inserted till throat level and 0.4 ml distilled water is injected and patient is observed for 3 seconds for assessment of swallowing; if swallowing is present the patient is at little or no risk for aspiration.

Although if swallowing is absent then again inject 2 ml of distilled water in throat, if aspiration occurs or if swallowing is again absent the patient is at high risk for aspiration.(6)

- Water drinking test, using 5 ml of water to check for intact swallowing reflex.

- Simple swallowing provocation test.

- Nasal and pharyngolaryngeal fibroscopy.

2. Good oral hygiene:

The oral cavity is a complex environment in which anaerobic bacteria, facultative aerobes, and spirochetes compete for space and nutrients.(7) Microorganisms that cause dental caries and periodontal disease can spread from the oral cavity and have been linked to systemic diseases, such as infective endocarditis, late prosthetic joint infections, and aspiration pneumonia. Following are the recommendations for attaining good oral hygiene:(8)

- Using an electric toothbrush or soft toothbrush, clean all surfaces of teeth and gums with fluoride toothpaste twice a day preferably with a soft pediatric toothbrush.
- Brush tongue with manual and preferably electric toothbrush removing plaque from dorsum of tongue.
- Rinse with chlorhexidine 0.12% solution 30 to 60 minutes after brushing or at some other time of the day to avoid dissipating the therapeutic effects of fluoride toothpaste.
- For dependent or poorly compliant resident use a tongue depressor for access and use a bite block to prop the mouth open. • Use frequent electric suction unit to prevent aspiration and ingestion of oral contents.

3. Patient Positioning:

- There is some evidence that keeping the head end of the patient's bed higher than 30-45 degrees reduces the incidence of nosocomial pneumonia caused by aspiration, especially in the critically ill or mechanically ventilated patients.(9)
- A chin-down position while feeding patients with altered swallowing ability, is helpful in preventing aspiration pneumonia.(10)
- Frequently changing the body position while keeping head end raised is important not only to avoid increased intragastric pressures but also to prevent bed-sores.

4. Measures related to gastric content and Feeding:

- Nasogastric tube, percutaneous endoscopic gastrostomy tube or jejunostomy tube for feeding in chronically debilitated patients.(11)

TREATMENT	RESULTS	RECOMMENDATIONS
DOPAMINE AGONIST	Improve swallowing risk and crease aspiration risk	Additional trial are warranted
AMANTADINE	Reduces risk of aspiration in elderly with stroke	Limited efficacy with adverse side effects. Trials warranted
CAPSAICIN	Improves cough and swallowing reflex	Increased bleeding risk. Not recommended
CILOSTAZOL	Reduce incidence of pneumonia in stroke	Additional trial needed
FOLIC ACID	Reduces the incidence of pneumonia	Can be given in high risk patients with folate deficiency
THEOPHYLINE	Improves the swallowing reflex	Narrow therapeutic window not recommended
ACE INHIBITORS	Reduces the incidence of aspiration of aspiration in non-randomized studies	Can be given in hypertensive stroke patients, randomized trials needed
PROTON PUMP INHIBITORS	Reduces gastroesophageal reflux & risk of aspiration	Useful, can be given but more trial needed
H2 RECEPTOR BLOCKERS	Reduce gastroesophageal reflux in bedridden to prevent aspiration	Sometimes helpful but additional trial needed
PROKINETICS (domperidone, metaclopramide)	Useful in bedridden elderly with feeding problems, prevents aspiration	Generally recommended. but large scale trial are needed for universal recommendation .

Table 3: Pharmacological Treatment to Prevent Aspiration Pneumonia

- Feeding by hand compared with insertion of feeding tube in the geriatric population is better for most patients.
- Soft mechanical diet and thickened liquids (nectar consistency).(12)
- Avoiding feeding at night. (from midnight to morning for continuous feeding)
- Continuous tube feeding at less than 80 ml per hour is better than intermittent bolus feeding via tube (NG or gastrostomy).
- Suction of subglottic secretions in the mechanically ventilated patient.(13)
- Minimise use of sedating drugs.
- Measuring gastric residual volumes to assess for risk of aspiration.(14)

5. Pharmacological measures to prevent aspiration:

Many drugs have shown promise in reducing the risk of aspiration and some of the drugs mentioned in various research papers are shown in Table 3. Most useful agents have been gastric prokinetics, gastric acid suppressants to prevent gastric reflux and ACE inhibitors to help regulate cough reflex in patients with stroke.(15-20)

Treatment for aspiration pneumonia:

1. Antibiotics:

The mainstay of treatment is antibiotics, which is tailored to targeting the causative bacteria in aspiration pneumonia. Microscopic examination of sputum commonly shows many polymorphonuclear cells with cultures showing a predominance of aerobic Gram-negative enteric bacteria such as *Escherichia coli*, *Klebsiella*, *Serratia*, *Proteus* and *Pseudomonas* species, followed less commonly by aerobic Gram-positive bacteria such as *Staphylococcus*, *Hemophilus* and *Streptococcal* species and rarely anaerobic bacteria such as *Bacteroides*, *Prevotella*, *Fusobacterium* and *Peptostreptococcus*.(21) For nosocomial-acquired aspiration pneumonia, the causative bacteria may be more virulent (i.e. MRSA, *Pseudomonas aeruginosa*), requiring other types of antimicrobial therapy based on culture and sensitivities of the sputum.(22)

2. Supportive Care: includes oxygen to correct hypoxemia, suctioning of oral secretions, intravenous fluids and nebulizer treatments. Some patients may require ventilatory support and monitoring in intensive care. Give intravenous steroids for suspected pneumonitis, and frequent suctioning for pulmonary toilet.(23)

3. Follow-up Care:

After aspiration pneumonia is diagnosed and treated, each patient should undergo evaluation by a speech-language therapist or trained nurse and dietician to assist in the decision of appropriate diet for the individual patient and teach strategies to prevent future aspiration.(24) Each patient will need individual care and planning to address their specific needs. In some patients, the placement of a feeding tube may be warranted.

Conclusion

Aspiration events are a common cause of morbidity and mortality among debilitated, terminally ill, and elderly patients, especially when enteral artificial nutrition or hydration is administered. Aspiration in adults is attributable to loss of protective reflexes in the setting of altered consciousness; and impaired neuromuscular function.(25) Chest radiographs in aspiration syndromes show characteristic yet non-specific abnormalities and antibiotic coverage of Gram-negative bacilli and Gram-positive cocci and anaerobes are indicated in the treatment of aspiration pneumonia. More emphasis should be laid on preventing this life threatening complication in the hospital setting rather than waiting to treat it. Bedsides, evaluation and imaging techniques should be utilised to assess the risk of aspiration and simple interventions should be initiated in high risk patients to help avoid aspiration pneumonia.

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