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From the Editor

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This is our first issue for 2009 and we wish our readers a better 2009 and for the Middle East Journal of Internal Medicine a prosperous and a productive 2009.

In this issue, we present two studies in reference to breast cancer. The first study examined the levels of fractions of serum glycoproteins in female patients with breast cancer in Greece. The study noted significantly higher levels of measured glycoproteins when compared to normal subjects. Additional studies are needed to determine the clinical application of serum glycoproteins in the flow up of patients with breast cancer. The second study examined the effectiveness of Tru-cut biopsy in reaching a definitive diagnosis of breast cancer. The study demonstrated an impressive sensitivity of 97%, and specificity near 100% in confirming the diagnosis of breast cancer.

Another study examined the positive contribution of a relatively new technology. Darwish et al looked at the impact of MRI in diagnosis and treatment decisions in a community hospital in Qatar. The study noted a significant change (more than 40 %) in diagnosis or management of patients after an MRI was obtained.

An article examining the influence of the internet in promoting a surgical clinic came from Melbourne, Australia. The authors noted significant communications with patients via the internet that culminated in recruitment of patients to the clinic. Local and international patients benefited from the website of the clinic and the authors were pleased with the statistics and results of the patients recruited via the internet.

Dr Maimoona Ahmed et al examined more than 16,000 urine specimens and noted, among other findings, a significant emergence of resistance to Sulphamethoxazole/ Trimethoprin in community acquired urinary tract infections. Dr Barzinjy et al noted a significant increase in the incidence of fungal Otomycosis in Hawler Area. The author decribes dry climate, wearing head clothes, presence of middle ear infection, wearing hearing aids and swimming as predisposing factors for fungal otomycosis.

The pattern of skin diseases in Samara district was examined by Dr Alsamarai. He noted an increase in the prevalence and incidence rates of skin diseases. The increase includes infectious diseases, dermatitis, urticaria and psoriasis. The author stresses the role for environmental sanitation in developing of skin diseases.

I hope you enjoy the selected articles of this issue as I did and once again Happy 2009.

A Study of Serum Glycoproteins in Patients with Breast Cancer

ABSTRACT

Background and objectives: Glycoproteins are conjugated proteins containing a prosthetic group hetro-saccharied which includes hexoses (galactose and mannose), sialic acid, fucose and hexose amine, as a group and have multiple and complex functions as enzymes, hormones, blood group substances and as constituents of extra cellular membranes. Additionally they participate in a large number of disease related functions of clinical relevance.

Materials and method: The present study deals with estimation of levels of fractions of serum glycoproteins, protein bound hexoses (PBH), protein bound fucose (PBF) and total proteins in fifty four patients of breast cancer in comparison with forty normal subjects, as well as the definition of their prognostic and predictive values.

Results: In patients with breast cancer the level of glycoproteins (protein bound hexoses, and protein bound fucose) and total protein were significantly higher compared to the normal subjects ($p<0.05$).

Conclusion: Based on findings of the present study it can be concluded that changes in the level of serum glycoproteins can be correlated with breast cancer. Also it may be useful as an additional follow up tool in those who have developed recurrent breast cancer.

Key Words: Breast cancer, Serum Glycoprotein.

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Introduction

Glycoproteins can be simply defined as proteins that have carbohydrate moiety covalently attached to their peptide portion. The carbohydrate moiety are monosaccharides, usually hexose, hexosamine, fucose and sialic acid[1,2].

There is a great variation in chemical and physical properties of glycoproteins according to their location and functions[3]. However glycoproteins participate in a large number of normal and disease related functions of clinical relevance, for example many of the proteins in the outer cellular membranes are glycoprotein such as proteins within the cell surface are antigens which determine the blood antigen system and the histo-compatibility and transplantation determination of individual immunoglobulin antigenetic sites and viral and hormone receptor sites in the cellular membranes[3].

The existence of glycoproteins, and their importance in many forms of life, has been recognized for more than 45 years. However, much about the biological function of the sugar moieties in glycoproteins remains a mystery. In some cases their function is fairly obvious. For example, mucins have a lubricating function, which can be related to carbohydrate residues[4], also particular sugar residue may act as a signal for recognition, either by other proteins or by whole cells. Thus, the carbohydrate moieties may influence growth and cell-to-cell interactions and be of importance in the development of cancer[3,5].

The level of different types of serum glycoproteins are maintained within a narrow range in health[6] but are elevated in many pathological conditions such as tuberculosis[7], autoimmune disease[8] cardiovascular disease, diabetes mellitus, trauma[9,10], prolonged bed rest, arthritis and psychiatric disorders[1,5]. However, increased concentrations of serum glycoproteins have

Material and Methods

1- Subjects

This study consisted of (94) individuals, 40 of whom were female volunteer controls, ranging from 22-67 years of age with no clinical evidence of any type of diseases. The remaining 54 individuals were primary diagnoses of breast cancer who registered in Hawler -Rezgari hospital in order to receive treatment, who underwent mastectomy and the diagnosis was histologically confirmed from the mastectomy specimen. The host information of the patients and normal subjects are summarized in Table (1).

This work was carried out in Erbil city, the collaborative study between the department of clinical biochemistry in College of medicine Hawler Medical university and the oncology department in the Rizgari Teaching hospital during the period between February and July 2005.

2- Collection of Samples:

Blood samples (5 ml) were taken by venepuncture from (94) individuals. The blood was allowed to clot, and the serum was recovered by centrifugation at 3000 rpm for 15 minutes for removal of any suspended cells. All the serum samples were stored in a refrigerator until analysis. Biochemical analysis was performed within 48 hours on serum samples for estimation of protein bound hexoses, protein bound fucose and Total Protein.

3- Methods:

A- Estimation of protein bound fucose (PBF)

Dische and Shettles[20,21] have described methods for estimation of protein bound fucose, which lead them to the determination of methyl pentose in serum. The method involves heating the serum sample with sulfuric acid for 3-10 minutes followed by the addition of cysteine. Satisfactory specificity for methyl pentose has been achieved by determining the optical densities at two wavelengths in order to correct for color developed by other sugars. Methyl pentose value is determined by measurement of optical density at wavelength 396 nm and 430 nm.

B- Estimation of protein bound hexoses (PBHex.)

Protein bound hexose was estimated by the method of Rimingto[22]. In this method, the hexose moiety of glycoprotein conjugates are precipitated by ethanol at room temperature and determined by orcinol reaction at 540 nm.

C- Estimation of total protein (TP)

Total protein is determined by biuret method according to B.L.Oser[23] in which peptide bondsof the protein react with cupric ion in an alkaline medium to form complex color products.

4- Statistical analysis:

Statistical analysis of the results was done using SPSS software (release 6.0; SPSS Inc., Chicago, IL, USA). Data were expressed as mean±SEM. The data so obtained was analyzed to obtain appropriate conclusions. Student 'Z' test was employed to find out the statistical significance. The levels of serum glycoproteins of normal healthy subjects were compared with those of patients with breast cancer concerning the P value. Statistical significance was set at $P < 0.05$.

Group I (Reference group):

The results of the present study are presented in Table2. The mean±S.E level for serum protein bound fucose was (10.2±0.18 mg/dl) with a range of variation (8.9-12.8)mg/dl. The mean values for protein bound hexoses was (97±3.2mg/dl) and the range of variation was (66-132) mg/dl and the mean of total protein was (6.59±0.07gm/dl) with a range of variation (5.9-7.8) gm/dl.

Group II (Breast Cancer patients):

The laboratory parameters of breast cancer patients are shown in Table. The mean±S.E for serum protein bound Fucose was (23±1.8mg/dl) with a range of (7.5-45) mg/dl. The mean values for serum protein bound hexoses was (150±23.2 mg/dl) with a range of (100-210mg/dl) and the mean level of serum total protein was (7.6±0.08 gm/dl) with a range of (6.8-9) gm/dl as shown in Table 2.

The ages were almost identical in both groups and glycoprotein was not influenced by age in normal healthy subjects with breast cancer.

A statistically significant difference in mean concentrations of protein bound hexoses (PBH) , protein bound fucose PBF) and total protein was observed between normal healthy subjects (Group I) and patients with breast cancer (group II). An elevated level of serum glycoproteins: protein bound hexoses PBH), protein bound fucose (PBF) and total protein was observed in patients with breast cancer in comparison with normal healthy subjects. Table (2).

The mean±S.E value of protein bound fucose to total protein ratio (TBF/TP) and protein bound hexoses to total protein ratio (PBH/TP) were (1.5±0.02 and 14.9±0.31) mg/gm respectively in normal subjects, and (3±0.02 and19±0.31) mg/gm respectively in patients with breast cancer. The mean values of PBF/TP and PBH/TP in sera of breast cancer patients were significantly elevated when compared to the normal healthy subjects, as shown in Table 2.

Discussion

In an attempt to evaluate the efficacy of glycoproteins as potential biochemical markers of breast cancer, we assayed a series of serum samples from patients with clinically defined breast cancer and healthy controls for protein bound fucose, protein bound hexoses and total

protein.

Our study clearly showed that the patients with breast cancer had significantly higher levels (P<0.01) of protein bound fucose in comparison with the control group .The results of these biochemical parameters levels were in agreement with previous reports[24,25,26,27,28,29,30].

However the mean Protein bound hexoses level in breast cancer was significantly higher (P<0.01) than that of the reference group. This finding is similar to that found by other investigators[24,26,30,32]. Also the mean total protein level was significantly higher (P<0.01) in patients with breast cancer compared to the control group. Similar results have also been reported[24,29].

There are many possibilities of increased serum Protein bound fucose, Protein bound hexoses, and Total Protein in breast cancer, like increased glycosylation of serum glycoproteins, shedding of glycoproteins from the tumor cell surface and increased normal serum glycoproteins[23]. Increased serum fucose concentrations in patients with cancer is also correlated with increases in certain acute phase proteins. Tumor itself may also contribute to circulating fucose concentration either by spontaneous release of glycoproteins as the mass grows or as a result of cell damage through host attack or treatment[30]. A number of studies[33,34] have shown that malignant change may be accompanied by increasing expression of membrane associated fucose containing macromolecules, Furthermore, tumors can shed fucosyl containing components into their environment. Tumors may also contribute indirectly to serum fucose by promoting increased fucosylation of existing glycoproteins and increased fucosyltransferase values have been noted in serum samples from patients with cancer[34].

This test may be useful therefore as an additional follow up tool in those who developed recurrent breast cancer and it may be equally applicable in those patents who have had one mastectomy and are, therefore a high risk group as regards developing carcinoma in the opposite breast. Generally it is an additional piece of information to be weighed along with the physical diagnosis and perhaps mammography in making a decision for biopsy, as much as it might represent another factor to aid in earlier detection of breast malignancy.

Conclusion

This study demonstrates a statistically significant difference in mean concentrations of glycoproteins : protein bound hexoses, protein bound fucose and total protein between normal healthy subjects and patients with breast cancer. Thus, the present study clearly shows the diagnostic importance of serum glycoproteins, although on the basis of present study findings it can be concluded that serum glycoprotein levels may serve as an indicator of breast cancer and aid in detection of breast malignancy.

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Table 1: The host information of breast cancer patients and reference groups

Group	Number of subjects	Age (years)	
		Mean	Range
Reference group	40	46.8	22-67
Patients with Breast cancer	54	49.29	18-75

Table 2: Biochemical parameters of the studied group

Substance assayed	Reference group		Patients with breast cancer		Statistical evaluation
	Mean ±S.E	Range	Mean ±S.E	Range	
Protein bound fucose mg/dl	10.27±0.18	8.9-12.8	23±1.8	7.5-45	P<0.01
Protein bound hexoses mg/dl	97±3.2	66-132	150±3.2	100-210	P<0.01
Total protein gm/dl	6.59±0.07	5.9-7.8	7.67±0.08	6.8-9	P<0.01
PBF/TP mg/gm	1.55±0.02	1.2-1.8	3±0.02	0.92-6	P<0.05
PBH/TP mg/gm	14.9±0.31	9.8-22	19±0.31	12-25	P<0.01
Age(years)	46.8±1.83	22-67	49.2±1.7	18-75	N.S

Pb statistics obtained by student - t- test. N.S =Non significant difference

Fungal and Other Microorganisms Involved in Otomycosis in Hawler Area

ABSTRACT

Background: Patients with clinical manifestations suggestive of otitis externa.

Objective: To study the prevalence of mycotic infection in these patients.

Methods: Ear swabs were taken from these patients and both direct examination and culture were done.

Results: The most common pathogenic fungal isolates were Candida species (8.4%) and Aspergillus niger (4.2%).

Conclusion: Besides Aspergillus and Candida species isolated in these patients, many bacteria were also seen. Dry climate, wearing head clothes, presence of middle ear infection, wearing hearing aids and swimming were predisposing factors for this infection.

Key Words: External otitis. Otomycosis.

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Introduction

Fungi cause some of the vilest and most recalcitrant of all human infections. They also gave rise to a wide range of less dramatic conditions that are virtually untreatable either because of absence of appropriate drugs or because antifungal agents cannot be delivered on site in the requisite concentration. One of such cases is otomycosis, a form of external otitis caused by fungi growing on shed skin in the ear canal. The condition is particularly common in regions of the world with a warm climate and varying humidity[1]. Some of the contributing factors are extremely moist, hot environment, chronic bacterial Otitis Externa, wearing hearing aids, swimming and wearing of head clothes. Bacterial infection comes as secondary infection with Otomycosis, but Aspergillus niger is considered a main causative agent[2].

Otomycosis is a superficial mycotic infection of the outer ear canal and accounts for 10% of the otitis externa cases. The infection may be either subacute or acute and is characterized by inflammation, pruritus, scaling and severe discomfort. The mycosis results in inflammation, superficial epithelial exfoliation, masses of debris containing hyphae, suppuration and pain[3].

There will be an inflammatory response with hyphae in the epithelium and in the exudates. A consensus has emerged that because fungal organisms are much more common in chronic external otitis than in acute disease, they are more likely to be implicated in the pathogenic process[4]. Aspergillus and Candida spp. are the most frequently recovered organisms. Slow-growing fungi might be missed unless special detection techniques are used[9].

In rare cases, chronic external otitis is a manifestation of an "id" reaction. A focus of fungal infection, (Dermatophytosis) elsewhere in the body can cause a secondary inflammatory process in the external auditory canal. As a result, patients with chronic external otitis must be examined for fungal infections in sites remote from the ear itself[5-6].

Furthermore bacterial infection of the external ear may create a real problem for ENT specialists. Organisms like Proteus, Pseudomonas and other skin inhabitants may cause otitis externa either as primary or secondary to fungal infection, commonly as superimposed on fungal infection. We have tried in this work to identify these agents in patients studied in this research.

Methods

This study was carried out during the period January-November 2005 at ENT department in Erbil teaching hospital and Department of Medical Microbiology, College of Medicine. One Hundred and fifteen (115) patients were investigated, of whom (95) presented with clinical manifestation suggestive of Otitis Externa, (55 males and 40 females). The other twenty (20) had no manifestation of Otitis Externa and they were not involved in any of the risk factors predisposing to the infection and were considered as a control group. The age range of patients was (1-70) years .Yet detailed history has been taken with special reference to predisposing factors.

Swabs were taken from the inflamed ear of each patient using a sterile disposable swab after gentle cleansing of the external meatus by suction and dry mopping whereas

the specimens were taken deep from the Otitis externa. In the lab the specimens were examined both directly under microscope and wet preparation (KOH %10) and dry smear stained by Gram's methods to detect the mycelia of fungas, yeast or any bacteria. Culture was done by inoculating on blood, MaConkey and Sabouraud's dextrose agar. They were incubated at (37Cº) for (2-3) days; and two plates of Sabourauds agar were inoculated, one kept at (37Cº) and the other at (27Cº), with plates showing no growth after the 7th day of inoculation, being discarded. Identification of bacteria isolated from the specimens study was done by conventional methods. API 20 S was another technique used for speciation of Staphylococcus; coagulase test was also used in this study[20].

API 20 C. was also used for speciation of Candida, germ tube method and clamidospore formation where used to differentiate Candida albicans from other species of Candida.

Results

Table 1 - 7 (at the end of this article)

Discussion

Otomycosis is frequently encountered in tropical and subtropical areas[11]. Diagnosis of this disease is often based solely on the clinical symptoms. The objectives of this study were to determine the prevalence, predisposing factors, and etiologic agents associated with otomycosis. Otomycosis was found in (12.6%) of cases of external otitis from a total of (115). Itching was the characteristic beginning feature, rapidly followed by pain, conductive hearing loss and tympanic membrane perforation. In this study the commonest age group involved was 10-20 years (32.63%). The distribution is significant statistically[12]. Others showed that the disease was more common in the first and second decade of life[13]. Still others showed the mean age was 50.5 years, where only a single patient was younger than 18 years of age[7-8].

In this study there was no significant difference between male and female patients, (57.9% and 42.1%) respectively. This result is in agreement with others[14] who stated that the incidence of otomycosis appears to be distributed equally between males and females; still others have shown that the incidence of the disease was significantly higher in females, mainly housewives, by a ratio of 2:1 female to male[12].

As expected the most common pathogen isolated from the ear canal of patients and control group was bacteria, (84.2% and 75%) respectively. Fungal agents were isolated in (12.6% and 10%) respectively. Bacterial superimposed infection comes as one of the common complications of mycoses of the ear[14]. Most common bacterial agents found in our study were Staphylococcus aureus, (22.1%), Pseudomonas spp, (18.9%), Streptococcus spp. (13.7%)

Candida species were the dominant isolated fungi (8.4%). C.albicans (4.2%) C.parapsilosis (2.1%), C.tropicali (2.1%).This was followed by Aspergillus niger (4.2%). An opportunistic filamentous fungus was identified as the cause of chronic bilateral otomycosis[15]. Aspergillus niger grows on cerumen, epithelial scales and detritus deep in the external canal. The resulting accumulation of these inflammatory materials along with cerumen and fungal debris result in plug formation which is extremely significant and usually leads to diminished hearing ability; pruritus, irritation of the surface layer of the external ear itself, is a predisposing factor for bacterial colonization. There may be superficial erosion of membranes. The lesion of Aspergilosis is dry unless it is complicated by bacterial involvement, where we see exudates and foul odor[16-17].

It is noteworthy that the bacteria routinely recovered from patients with chronic external otitis are essentially the same as those encountered in acute bacterial external otitis and in chronic suppurative otitis media(18). Most organisms are Gram-negative, and Pseudomonas spp. is by far the dominant pathogens, accounting for 30 to 50% of positive cultures. Staphylococcal organisms are seen in 10 to 20% of cultures, and a variety of other Gram-negative organisms accounts for the remainder of recovered pathogens.

In this study the most common predisposing factor was dry hot climate, (100%) followed by previous ear infection (87.3%), which is in agreement with others[19], who found that the incidence of otitis externa diseases in the general population is related to environmental or seasonal conditions. In this study most of the conditions were observed in summer and spring time, (32.6%), (28.4%) respectively.

The presence of bacterial infections with or without treatment by topical or systemic antibiotics appears to change the physiochemical environment of the meatus and facilitate fungal growth. It has been hypothesized that the prolonged exposure to water, and frequent swimming predisposes to otomycosis by removing the protective ceruminous layer, allowing the skin to soften and absorb moisture. This causes swelling and obstruction of sebaceous and ceruminous glands thus preventing replacement of the cerumen. Itching results, which may give rise to scratching and more itching. When the surface barriers to microbial penetration are disturbed organisms that are normally found in the ear such as (Staphylococcus epidermis), (Pseudomonas, and Staphylococcus aureus) and fungi are able to penetrate and thrive in the orifices of the epithelial glands. The inflammation then becomes more severe and the infection progresses[11].

Some researchers have showed that certain environmental factors have been implicated, specifically high temperature, high humidity, excessive cleansing and scratching /digging at the ear canal, excessive use of eardrops containing antibiotic and corticoids, allergy to chemicals or hair dyes, endocrine disorders such as anemia, vitamin deficiencies, and diabetes. All these factors lower the body's, resistance to establishing such infection[10].

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Table 1 shows the age distribution. The highest incidence of otomycosis was at the age group of 10-20 years, (32.63%).

Age Group	No. of patients	Percentage	No. of Control	Percentage
1-10	12	12.63	5	25
10-20	31	32.63	6	30
20-30	29	30.52	4	20
30-40	15	15.8	3	15
40-50	5	5.3	2	10
50-60	0	0	0	0
60-70	3	3.15	0	0
Total	95	100	20	100

P=0.015

Table 2 shows sex distribution among patients and control group.

Sex	NO.of patients	Percentage	NO. of Control	Percentage
Male	55	57.9	15	75
Female	40	42.1	5	25
Total	95	100	20	100

P=0.51

Table 3 shows the distribution of the type of microorganism isolated from patients and control group. The highest figure was for bacteria, (84.2%), Fungi (12.6%) and no growth in (3.2%). The differences are significant.

Type	No. of patients	Percentage	NO. of Control	Percentage
Bacteria	80	84.2	15	75
Fungi	12	12.6	2	10
No Growth	3	3.2	3	15
Total	95	100	20	100

P<0.001

Table 4 shows the frequency of the microorganisms isolated from patients and control group. The most common bacterial pathogen was Staphylococcus aureus (22.1%). The most common fungal agent was Candida species (8.4%).

Microorganism	No. of patient	Percentage	No. of Control	Percentage
Pseudomonas aeruginosa	18	18.9	0	0
Streptococcus Pneumoniae	13	13.7	0	0
Proteus mirabilis	10	10.5	0	0
Staphylococcus aureus	21	22.1	0	0
Staphylococcus epidermidis	7	7.4	5	25
Micrococcus Spp.	2	2.1	0	0
Candida albicans	4	4.2	2	10
Aspergillus niger	4	4.2	0	0
Candida parapsilosis	2	2.1	0	0
Candida tropicali	2	2.1	0	0
Neisseria Spp.	3	3.1	0	0
Diphtheroid Spp.	2	2.1	0	0
Strept. Viridans	0	0	4	20
Mixed growth	2	2.1	0	0
Bacillus Spp.	0	0	2	10
Klebsiella Spp.	2	2.1	0	0

Corynebacteria Spp.	0	0	1	5
E. coli	0	0	3	15
No growth	3	3.1	3	15
Total	95	100	20	100

P = 0.04

Table 5 shows the result of direct examination of the specimens after preparation.

Direct Examination	Positive for bacteria	Pus	Epithelia	Spore	Hyphae
0	32	21	34	71	77
4-6	27	15	11	5	3
1+	27	35	24	15	12
2+	7	17	23	4	2
3+	2	7	3	0	1
Total	95	95	95	95	95

Table 6 shows some of the predisposing factors associated with the otomycosis. Dry hot climate was the most common factor in all patients, followed by previous ear infection (87.3%); swimming (60%), and topical eardrops in (45.3%).

Predisposing Factor	No.	Percentage
Ear infection	83	87.3
Head wear	28	29.5
Swimming	57	60
Dry climate	95	100
Topical ear drops	43	45.3
Wearing hearing Aids	27	28.4

P=0.02

Table 7 shows the seasonal distribution of the disease. Most of the conditions were observed in Summer (32.6%) and least in Autumn (13.7%).

Season	No.	Percentage
Summer	31	32.6
Autumn	13	13.7
Winter	24	25.3
Spring	27	28.4

P=0.16

Antibiotic Resistance Pattern of Uropathogens in Community and Hospital Acquired Urinary Tract Infections

ABSTRACT

Objectives The aim of the study was to identify the most frequent etiological agents and the profile of antimicrobial agents of the bacteria isolated from urine cultures from community and hospital acquired urinary tract infections so that the study can provide guidelines for choosing an effective antibiotic therapy.

Method A retrospective study conducted at King Abdul Aziz University Hospital, a tertiary care teaching hospital. A total of 880 positive urine cultures were reviewed during a period from May 2007 to May 2008. Charts were reviewed for age, sex, presence or absence of diabetes mellitus, pregnancy, department from where the specimen was sent, duration of culture (hospital or community), bacterial isolates with their sensitivity and resistance to different antibiotics was recorded.

Results Out of 16,200 urine samples received, 880 were positive for significant bacteuria with a prevalence of 5.4%. Of 880 clinical cases isolated 372 (42.3%) were from Ob/Gyn department followed by outpatients 138 (15.7%), and 127 (14.4%) from the medical department. Male to female ratio was I : 3.6. Infection was community acquired in 589 patients (66.9%) and hospital acquired in 291 (33.1%). The majority of the patients were non-diabetics, being 742 (84.3%) against 138 (15.7%) non-diabetics. Urinary catheter was the cause of infection in 195 (22%) of patients. E.Coli was the predominant pathogen both in the community and hospital acquired infections (Table 1). Community acquired E.Coli was greater than 40% resistant to Sulphamethoxazole/Trimethoprin {SMX/TMP}, and Pipracilline, more than 70% to Ampicillin and Amoxycillin/Clavunic acid, whereas hospital acquired E.Coli was 75% resistant to Ampicillin, 52.8% to SMX/TMP,57.1% to Pipracillin and more than 40% resistant to Oxacillin, Ciprofloxacin and Norfloxacin and 100% to Ceftriaxone. Nitrofurantoin, which showed resistance of less than 16% can be used as an empirical therapy in both the groups of E.Coli infection. (Table 2).

Conclusion The results of our retrospective study demonstrated the distribution of microbial isolates causing urinary tract infections and their susceptibility pattern to commonly used antibiotics. E.Coli was the commonest pathogen followed by Klebsiella and Pseudomonas in both hospital and community infections. Ampicillin, Sulphamethoxazole/Trimethoprim (SMXTMP), and Amoxycillin/Clavunic acid cannot be used as empirical therapy for E.Coli infections in both the groups. For Klebsiella and Pseudomonas infection in community and hospital acquired infections and during pregnancy Nitrofurantoins showed high resistance, Quinolones and Cephalosporins can be used in this group empirically.

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Methods

Culture proven urine isolates were retrospectively studied. The samples were collected between May 2007 to May 2008 from both the inpatients and outpatients department of King Abdul Aziz university hospital, a tertiary care teaching hospital. The majority of samples were midstream urine specimen, others included catheterized urine samples. Culture was done by the calibrated loop technique delivering 0.001ml of urine and plated on Cystine -Lactose-Electrolyte-Deficient (CLED) agar plates. Each plate was innoculated with 6 tests, each in dublicate, after overnight incubation at 37 degrees. The number of colonies in the impression area were counted, and if over 25 colonies were present, the original urine sample was known to have contained greater than 105 organisms per milliliter, indicating significant bacteriuria. The isolates were identified using the standard method(1). Gram negative bacilli are identified using API 20 (Analylab Inc). The antibiotics tested on each disc were ampicillin 10 mcgm per disc, Norfloxacin 10 mcgm, Amoxicillin/Clavulanic 30 mcgm, Pipracillin 100 mcgm, Trimethoprim 5mcgm ,Ciprofloxacin 10 mcgm, Cefuroxime 30 mcgm, ceftazidime 30 mcgm, ceftriaxone 30mcgm, Cefepime 30 mcgm, Amikacin 30 mcgm, Gentamycin 30 mcgm, Aztreonam 30 mcgm, Meropenam 10 mcgm and Imipenam 10 mcgm, Nitrofurantoin 300 mcgm, Levofloxacin 5 mcgm,

Oxacillin 1 mcgm, Cefatoxime 30 mcgm, Tetracycline 30 mcgm, Pipracillin/Tazobactam 75 mcgm.

Charts of patients were reviewed for age, sex, department from where the specimen was sent, presence or absence of diabetes mellitus, pregnancy, duration of culture, whether hospital acquired or community acquired. Cultures within the 72 hours of admission were considered community acquired and those after as hospital acquired. The organism isolated and its sensitivity and resistance were recorded.

Results

Out of 16,200 urine samples received for culture during the period of May 2007 to May 2008, 880 were positive for significant bacteuria with a prevalence of 5.4%. 372 (42.3%) of clinical isolates were from the department of Ob/Gyn, 324 (36.8%) were from pregnant patients. Male to female ratio was n 1:3.6. Diabetics were 138 (15.7%) whereas non-diabetics were 742 (84.3%). Urinary catheter was the cause of infection in 195 of patients (22%). Infection was community acquired in 589 (66.9%) whereas 291 (33.1%) were hospital acquired. E.Coli was the commonest pathogen both in hospital and community acquired infection, 186/589 (31.6%) and 86/291

(29.6%). Community acquired E.Coli was greater than 40% resistant to Sulphamethoxazole/Trimethoprim (SMX/TMP), Pipracilline and more than 70% to Ampicillin, Amoxycillin/Clavulanic, whereas hospital acquired E.Coli was 75% resistant to Ampicillin, 52.8% to SMX/TMP, 57.1% to Pipracillin and more than 40% resistant to Oxacillin, Ciprofloxacin and Norfloxacin and 100% to Ceftriaxone. Hospital and community acquired Klebsiella was more than 70% resistant to Nitrofurantoin, Pipracillin and Ampicillin. On the other hand Pseudomonas was sensitive to most antibiotics in both the groups except Nitrofurantoin and Amoxicillin/ Clavulanic acid 66.7%, and 100 % to Ampicillin (table 2).

E.Coli in pregnant women was 62.2% resistant to Ampicillin, 36.6% to Pipracillin, whereas Klebsiella and Pseudomonas were more than 75 % resistant to Nitrofurantoin, Pipracillin and Ampicillin. For E.Coli infection in pregnancy Nitrofurantoin can be used empirically and Cefuroxime, Amoxycillin/Clavulanic can be used as an oral agent for Klebsiella and Pseudomonas during pregnancy (Table 3).

Discussion

Urinary tract infection (UTI) is the most common of all bacterial infections to affect persons throughout their life span. Females are more likely to be affected than males except in neonates where the trend is reversed[2,3,4]. The bacteriological profile varies from country to country and from city to city. In recent years, bacterial resistance to different antibiotics has risen dramatically leaving physicians with few therapeutic options. The prevalence of bacteuria at King Abdul Aziz University hospital has fluctuated over the years from 6 % in 1986[5] to 11% in 2000 and 5.4% in the current study. The pathogens causing urinary tract infections (UTI) are well known and E.Coli is the main etiologic agent in both community as well as hospital acquired infections[3,6,7]. In the present study E.Coli was also the predominant pathogen in both the groups. Klebsiella was the 2nd common organism in hospital acquired infection followed by Pseudomonas. It is recommended that in a community where the rate of resistance to Sulphamehoxazole/Trimethoprim (SMX/TMP) is greater than 20% among urinary tract isolates. Alternate antimicrobial agents should be considered as the first line of treatment[9,10,11,12] Our study showed resistance of 43.9% in community acquired versus 52.5% in hospital acquired infections, whereas Nitrofurantoin and Flouroquinolones, Aminoglycoside and Cephalosporins showed sensitivity of 70-90% in both groups of UT I. A study done by Al Ghamdi from the eastern province of Saudi Arabia showed that the most frequent antibiotic dispensed by the pharmacist over the counter without prescription from the physician was Flouroquinolones 69% followed by Co-trimaxazole and oral Cephalosporins[13]. Unless this practice is stopped there will be emerging resistance to these antibiotics very soon. In the USA the empiric regime for acute uncomplicated cystitis is a 3 day course of double strength of SMX/TMP. This current empirical regimen is likely to be replaced by alternative therapy such as the Fluoroquinolones or Nitrofurantoin[14,15,16,17]. The antibiotic resistance against SMX/TMP could be attributed to their wide usage for a variety of Indications, with Aminoglycosides and Cephalosporins being injectable, they are used restrictively in the hospital care setting and hence have shown better sensitivity rate.

Bacteuria occurs in 2-7% of pregnant women, a similar prevalence as in non-pregnant women. The organisms are also similar in virulence in pregnant and non pregnant women[18]. This was in accordance with our study where streptococcus agalactaie was the commonest organism followed by E.Coli, Klebsiella and Pseudomonas.

Early screening for, and treatment of, any potential bacteuria has maternal and fetal benefit[19,20,21]. This was the reason for the majority of positive urine culturescoming from the Ob/Gyn ward (372/880: 42.3%). There is little information about the safety of many newer antibiotics in pregnancy. It is generally accepted that Cepahlosporins and Nitrofurantoin are safe in pregnancy[22,23]. Our study showed Nitrofurantoin can be used for E.Coli, whereas Cepahlosporins and Flouroquinolones can be used for Klebsiella and Pseudomonas.

Conclusions

The changing spectrum of micro organisms involved in UTI and the emerging resistance requires continous monitoring to guide empirical therapy. Results from developing countries are different than those from the developing countries due to antiobiotic prescribing habits, as most of the antibiotics are readily available over the counter. E. Coli, Klebsiella and Pseudomonos remain the common pathogens causing UTI both in hospital and community acquired infections. Ampicillin, SMX/TMP, Pipracillin, Amoxycillin/Clavulanic cannot be used as first line treatment in E. Coli in both hospital and community infections. Cephalosporins except Ceftrixone and Nitrofurantoin can be used as empirical therapy in these patients. Nitrofurantoin cannot be used for Klebsiella or Pseudomonas infections during pregnancy or for hospital and community acquired infections. Quinolones and Cephalosporins are the antibiotics of choice.

Treatment should as far as possible be based on local data and since that may also vary from time to time in the same hospital, periodic surveillance is recommended.

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Table 1 – community and hospital acquired urinary Isolates

Organism	Community acquired	Hospital acquired
E.Coli	186 {31.6%}	86 {29.6%}
Strep. Agalactaei	182 {30.9%}	56 {19.2%}
Klebsiella	59 {10.0%}	30 {10.1%}
E. Feacalis	55 {9.3}	26 {8.9%}
A. Baumannii	29 {4.9%}	16 {5.5%}
Pseudomonas	22 {3.7%}	21 {7.2%}
Candida Albicans	18 {3.0%}	17 {5.8%}
A. Cloacae	12 {2.0%}	8 {2.7%}
Staph.Epidermidis	7 {1.2%}	2 {0.7%}
Staph.Aureus	7 {1.2%}	9 {3.0%}
Proteus	6 {1.0%}	13 {4.5%}
Diptheroids	5 {0.84%}	3 {1.0%}
Morganella Morgani	1 {0.16%}	4 {1.3%}

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Table 2 - Resistance pattern of antibiotics in Hospital and Community acquired urinary pathogens

Antibiotic	**C.A E.Coli**	**H.A – E.Coli**	**CA Klebsiella**	**H.A Klebsiella**	**C.A Pseudo.**	**H.A Pseudo.**
	%	%	%	%	%	%
Nitrofurant	16	9.6	70.6	76	NT	66.7
Ciproflox	25.4	45.5	11.5	18.5	10	23.5
Levoflox	36.4	33.3	0.0	NT	NT	NT
Oxacillin	17.3	46.2	10.8	NT	11.8	33.3
Norflox	19.7	40	11.4	15.4	10	26.7
Pipracillin	43.3	57.1	88.7	93.1	0.0	22.2
Ampicillin	70.9	75	0.0	96.4	100	100
Amox/clav	70.1	37.7	11.5	18.5	0.0	66.7
Genta	6.1	23.5	7.1	17.2	5	29.4
Amikacin	32.4	1.3	0.0	3.4	10	5.6
Cefurox	21.4	NT	10.9	12	0.0	0.0
Ceftaz	9.8	23.9	7.8	15.4	15.8	29.4
Ceftriax	8.3	100	0.0	NT	NT	NT
Cefatox	7.9	21	6.3	12.5	NT	0.0
Cefepime	8.6	22.4	7.3	17.9	5.3	16.7
Tetracyc	50	66.7	33.3	100	NT	NT
Pip/Tazob	4.8	6.3	11.1	15.4	0.0	5.0
Meropenam	0.6	0.0	13.6	3.4	5.0	12.5
Tmp/smx	43.9	52.8	29.6	3.4	NT	0.0

NT = Not Tested, CA = community acquired, HA = hospital acquired

Table 3 - Antibiotic resistance pattern in pregnant and non - pregnant women to commonly grown pathogens

Antibiotics	**Pregnant E.Coli**	**Non preg E.Coli**	**Pregnant Klebsiella**	**Non preg Klebsiella**	**Pregnant Pseudomo**	**Non preg Pseudomo**
	%	%	%	%	%	%
Nitrofurant	7.4	11.7	75.0	72.5	100	50
Ciprflox	11.1	41.7	12.0	14.8	0.0	17.1
Levoflox	16.7	45.5	0.0	0.0	NT	NT
Oxacillin	5.7	34.5	0.0	16.7	0.0	23.7
Norflox	5.6	35.9	4.8	14.6	0.0	18.2
Pipracillin	36.6	54.1	88.5	90.9	50	8.6
Ampicillin	62.2	76.9	96.2	100	100	100
Amox/clav	22.4	37.0	8.0	17.0	0.0	66.7
Genta	4.1	15.3	3.8	13.8	0.0	17.1
Amikacin	0.0	0.6	0.0	1.8	0.0	8.3
Cefurox	12.5	32.8	0.0	0.0	0.0	0.0
Cetazid	4.5	18.6	4.5	13.0	0.0	23.5
Ceftriax	0.0	25	0.0	0.0	NT	0.0
Cefatox	7.4	14.3	4.8	10.0	0.0	0.0
Cefepime	5.5	16.4	4.2	13.8	0.0	11.4
Tetracyc	50	57.1	50.0	50.0	NT	NT
Pip/tazob	1.9	7.5	9.5	14.3	0.0	2.8
Meropenam	NT	NT	0.0	5.3	0.0	8.8
TMP/SMX	38.2	50.3	26.9	30.2	0.0	NT

NT= Not Tested

Prevalence of Skin Diseases in Samara, Iraq

ABSTRACT

Background: Skin diseases are common in the community, affecting both sexes and all age groups. The burden of skin diseases in any community reflects genetic constitution of its numbers, nutritional status, social and hygienic standards, customs, and occupations. The incidence and prevalence of skin diseases are affected directly and indirectly by the climate and influenced by the quality and quantity of medical care available.

Objectives: To estimate the prevalence and incidence of skin diseases in Samara, Iraq according to ICD-10.
Study design: A retrospective study performed to determine the prevalence of skin diseases in the normal population in Samara district.

Patients and methods: For the general population the survey is a hospital based study, carried out from December 1991 to end of December 2005. The records of 160,975 patients were reviewed, while for the SDI workers, 120 records were reviewed. There are 167,415 episodes of skin diseases in the general population of Samara district, =and these were analysed to determine the incidence and prevalence of skin diseases among the population of Samara.

Results: The prevalence of skin diseases for Samara district was 24.9%, while the incidence was 3.56%. Skin infection was the predominant skin disease group (33.9%), followed by dermatitis (32.7%). Fungal infection was the commonest (13.7%) type of infection, followed by viral infection (8.6%). For the dermatitis group, contact and atopic dermatitis were the common types forming 12, 1% and 10.2% respectively.

Conclusion: The pattern of skin diseases in Samara district has not changed with time. However, the prevalence and incidence rates have increased. The increase includes infectious diseases, dermatitis, urticaria and psoriasis indicating there may be a role for environmental sanitation and stress in developing of skin diseases.

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Introduction

Skin diseases are common in the community, affecting both sexes and all age groups. The burden of skin diseases in any community reflects genetic constitution of its members, nutritional status, social and hygiene standards, customs, and occupation. The incidence and prevalence of skin diseases is affected directly and indirectly by the climate and influenced by the quality and quantity of medical care available[1].

Geographical factors are important, in particular, skin conditions due to infection and dermatitis[2,3].

Dermatoepidemology, the study of distribution and causes of skin diseases in the human population has expanded rapidly[4]. The concept of considering the health of entire populations also applies to the classification of skin diseases. All the reported hospital based surveys used the ICD-9 classification. However, two community based studies using ICD-10 classification of skin diseases were reported[5,6]. Around one quarter to one third of the population has a skin disease that can benefit from medical care at any one time[7,8]. Consultants of skin disease in general practice realize the highest relative increase in skin diseases over recent years[9].

Prevalence and incidence rates are the primary tool to describe disease occurrence, and they can be compared across populations or subgroups to generate hypotheses and planning for the provision of health in the community[10]. Comparison between studies performed in different geographical areas is difficult as the studies performed are different in study design, study population, and method of sample selection, classification of diseases, and whether they are CBS or HBS[3,11]. However, some general points can be made regarding skin diseases in developing countries; that is, skin diseases are very common and infections are predominant.

Our survey indicated a prevalence rate of skin diseases in population based studies conducted throughout the world which varies from 4.9% to 50 %[2,5,6,11-15]. Most studies on frequency of skin diseases in Iraq have been done on a small scale and are not comprehensive because they are either based on hospital attendance, or only on a specific group of population such as a school or an occupation[3]. However, five large studies were reported on HBS[2] and four CBS[5,3]. All of the studies that were performed in Iraq, irrespective of their study design and target population studied, demonstrated that infections and dermatitis were the most common skin conditions[2-5,16]. Studies on occurrence of skin diseases in Arabian countries have the same limitations as that for Iraqi studies. In three studies reported for Jordan[17], Kuwait[18], and Egypt[19], dermatitis and skin infections form the predominant skin disease groups. Other studies were performed on selected groups of disease condition.

In Iraq, no previous study was published about the incidence of skin diseases based on a large hospital study using ICD-10 classification of diseases. The hypothesis to be tested is that the skin disorders are common in Iraq and there may be an increase in incidence and prevalence

rates of some skin disorders in certain population settings.

Objective: To Estimate the prevalence and incidence of skin diseases and groups of skin diseases in Samara District, Iraq.

Patient and Methods

Study design: A Retrospective study was performed to determine the prevalence of skin diseases in the normal population in Samara district.

Study population: For general population, the survey is a hospital based study, carried out from December 1991 to end of December a 2005 and from 2000 to end of 2005 for the SDI workers. For the general population of Samara, the record of 160,975 patients was reviewed, while for the SDI workers 120 records were reviewed.

There are 167,415 episodes of skin diseases in the general population of Samara district and 120 episodes of skin diseases for SDI workers and these were analyzed to determine the incidence and prevalence of skin diseases among the population of Samara province located 100 miles North of Baghdad and has a population of (223,117) based on the 1992 census and of (312, 125) for the 2003 census. The data were collected by reviewing the records of patients who attended the dermatology clinic in Samara. It is a primary health care clinic. During the attendance the patients were examined thoroughly and a diagnosis of skin disease was mainly based on clinical examination according to conventional methods[1]. Many patients had more than skin problem. Laboratory investigations was performed in some patients to confirm the diagnosis on clinical grounds.

Results

The prevalence of skin diseases for Samara district was 24.9%, while the incidence was 3.56%; skin infection was the predominant skin disease group (33.9%), followed by dermatitis (32.7%) Table 1. Fungal infection was the commonest (13.7%) type of infection, followed by viral infection (8.6%). For the dermatitis group, contact and atopic dermatitis were the common types forming 12, 1% and 10.2% respectively. Furthermore, acne was the commonest (9.1%) form of skin appendages diseases group. Psoriasis formed 2.7% of skin disease frequency (Table 2).

For fungal infections, tinea capitis was the commonest (4.7%) followed by pityriasis versicolor (4.5%) and tinea pedis (3.6%). For bacterial infection, impetigo was the predominant (3.7%) bacterial infection, while wart was the commonest (2.2%) viral infection. In addition, scabies was the predominant (3.8%) parasitic skin disease (Table 3)

The most common 15 diseases are shown in Table 4. CD was the commonest skin disease (12.1%), followed AD (10.2%), Acne (9.1%), Urticaria (6.3%), and tinea capitis (4.7%).

Discussion

The concept considering the health of the entire population also applied to the classification of skin diseases. Chronicity and/or severity of skin diseases make the dermatologist preoccupied with deviants at the extreme end of the normal distribution curve. Thus, thinking in terms of population rather than individuals, we exhibit the population's own unique characteristics and problems that enable a community diagnosis to be achieved[20]. The concept of a distribution of disease severity at a population level may also be helpful in evaluating different treatment policies[21]. Dermato-epidemology has become an important branch in dermatology during the last years. It is considered an attractive area for research as suggested by William & Strachan[22].

This study was carried out to provide information on the extent of the skin diseases among the population of Samara district. To my knowledge this is the second hospital based data on a large scale on the prevalence and incidence of skin diseases in Samara and Iraq. The sample consisted of 160,975 patients' records with 167,415 episodes of skin diseases. This sample was a selected type of data that provided results which could be regarded as approximately valid to Samara district and is appropriate for discussion and comparison with other studies. However, one should be cautious when attempting to apply the results to the whole population of Salah ul-dean governorate.

The overall incidence rate was 3.56%. This incidence rate was higher than that reported in a previous study, performed for the same area during the period 1992-1993 where the incidence rate was 2.5%[2]. In addition, the overall prevalence rate was 24.9% and this prevalence rate was 5 times more than that reported in a previous study for the same geographical area[2].

In comparison with other selection population studies conducted throughout the world, it can be shown that the overall prevalence rates varied from 4.9% to 50%[3-5,11-15]. This range of prevalence rates, is almost consistent with the present study findings, although there are variations in the reported rates which may be due to differences in study design, sample size, study population, diagnostic criteria, race, geographical and social factors[22].

In comparison to studies conducted in Iraq, the prevalence rate demonstrated in this study (24.9) was about similar to that reported for Tikri[6], a city within the same governorate to which Samara belongs. However, the prevalence rate of this study was lower to that reported for Kirkuk (28.15%)[12] and higher than that reported for

Basrah (22.63%)[5].

In this study the 10th revision of international statistical classification of diseases related disorders (ICD-10) for classification of skin diseases in studied population was used[23]. Following this classification, the most common disease group which was observed in Samara district was infection and dermatitis. A similar pattern is reported in Iraq for Samara[2], Kirkuk[12], Basrah[5] and Tikrit[6]. However, in a study reported for Tikrit, the leading cause was dermatitis followed by infection. Furthermore, the same pattern was reported in developing countries[24-29] and Arabian countries[17-19,30].

Fungal infections were the predominant type of infections. This finding was consistent with that reported for Iraq (Basrah, Kirkuk, Samara), Kuwait and Egypt[18,19]. However, this study finding didnot agreed with that reported for Tikrit, since bacterial infections were the predominant type of infection[6]. Concerning the dermatitis group, contact dermatitis, was the predominant type of dermatitis, followed by atopic dermatitis, and this finding was consistent with that reported for Iraq[2]. In addition, the present study indicated a rise in fungal, viral, and parasitic infections when compared to the study performed for Samara district during 1992-1993[3].

Prevalence rates of Contact dermatitis were lower than that reported for Tikrit[6], but it is higher than that reported for Samara in a previous study, inKirkuk. While the prevalence rate of atopic dermatitis was higher than that reported in studies for Iraq, Pityrasis versicolor prevalence rate was lower than that reported for Basrah and higher than that reported for Samara, Kirkuk, and Tikrit.

Acne is a skin disease with a psychological burden and its management is vital and should be with less side effects. One of the reported findings of the present study is that the prevalence rate of vulgaris was higher than that reported for Samara and Kirkuk, but it is lower than that for Basrah and Tikrit. The prevalence rate of hair fall, urticaria, SD, Tinea capitis, scabies as this study indicated; showed an increased rate when compared to the previous study reported for the same geographical area, and either lower or higher to rates reported for Tikrit, Basrah, and Kirkuk[5,6,12].

The present study indicated that the most common skin diseases arranged indecreasing order are: CD (12.1%), AD (10.2%), Acne (9.1%), Urticaria (6.3%), Tinea capitis (4.7%), pityrasis versicolor (4.5%), Hair fall (4.3%), SD (4%), Scabies (3.8%), and Impetigo (3.7%). Other studies performed in Iraq (Table 1), indicated different patterns of leading disease. For Basrah, acne was the predominant (16.79%), followed by pityrasis versicolor (6%). In the Tikrit study, contact dermatitis was predominant (17.11%) followed by urticaria (4.85%), and for Kirkuk, acne was the commonest disease (7.63%), followed by contact dermatitis (7.1%).

In conclusion, this study indicated that the pattern of skin diseases in Samara district was not changed with time. However, the prevalence and incidence rates were increased. The increase includes infectious diseases, dermatitis, urticaria and psoriasis indicating there may be a role for environmental sanitation and stress in developing of skin diseases.

Recommendation

1. Establishment of a family medicine department in Iraqi Medical Colleges to achieve primary healthcare teaching programs for medical students.
2. Implementation of family and community health programs in areas situated next to the faculty. During weekly visits, students collect data about the composition of family, diet, health, sanitation, etc.. The main objective is to learnabout the family's health situation and identify health determinants that can be improved. The project activity approach was to be subjective, objective, evaluative and planned (SOEP). This approach is to be used during family visits.
3. Establishment of a Dermatology department within the Iraqi Medical College. This department raises the level of awareness toward inducing quality in dermatological diseases education. Their goal would be the development of Dermato- epidemiology and run preventive and control programs for skin diseases.
4. Implementation of quality assurance systems by Ministry of Health with mechanisms to address concerns, needed to be instituted.
5. Development of effective models for healthcare delivery in rural and remote communities that are experiencing chronic shortages of healthcare professionals.
6. Integration of teaching of public health in clinical clerkships. The curriculum should be based on health needs of the population and the organization of the health system. The graduating student should be competent in diagnosis and basic treatment of conditions commonly found in the community and should be able to identify optimal pathways of treatment. To achieve this goal, public health and clinical objectives should be integrated. However, clinical teaching tends to be patient centered, but there are plenty of opportunities to introduce public health. During ward rounds and outpatients clinics, the teacher can require students to include the physical and socio-economic environment and patients' lifestyles in the medical history. The student treatment plan should take account of this expanded history, including appropriate health promotion, protection, illness preventive intervention, and demonstrate effective and efficient use of health system resources.
7. Medical colleges in Iraq should make an effort to attack

and retain students from vulnerable and underserved populations. These students should be encouraged to return to practice in their community of origin after graduation, and training should reflect the needs of these populations.

8. Establishment of university departments of rural health in Iraq. These departments to be located within the community and run educational and training programs, which include rural and remote undergraduate clinical placements; bachelor and post graduate degree courses; vocational training; professional development; indigenous health workers and diplomata in clinical laboratory investigations. These programs are multidisplinary, vertically integrated programs designed to provide health professionals with careers to rural and remote communities, which will translate to workforce recruitment and retention.

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Table 1. Prevalence of skin diseases in the general population according to ICD-10 groups

Group	Frequency in percent
Dermatitis	32.7
Skin infection	33.9
Papulosquamous diseases	4.7
Appendegeal Disease	14.3
Urticaria and EM	10.1
Bullous diseases	0.2
Others	4.1

Table.2. Prevalence of skin diseases in the general population according to sub–groups.

Group	**Frequency in percent**
Dermatitis	
Atopic	10.2
Contact	12.1
Seborrhoeic	4.0
Others	6.4
Skin infections	
Fungal	13.7
Bacterial	7.3
Viral	8.6
Parasitic	6.3

Papulosquamous diseases	
Psoriasis	2.7
Lichen planus	0.9
Others	1.1
Appendegeal diseases	
Acne	9.1
Hair disorders	4.3
Others	1.9
Urticaria and EM	10.1
Bullous diseases	0.2
Others	4.1

Table.3. Frequency distribution of infections

Group	**Frequency as percent**
Bacterial	
Impetigo	3.7
Abscess	3.6
Others	1.0
Viral	
Wart	2.2
Chickenpox	1.8
Herpes simplex	1.7
Others	1.9
Fungal	
Tinea capitis	4.7
T. pedis	2.6
T. corporis	1.2
P. versicolor	4.5
Others	2.7
Parasitic	
Scabies	3.8
Pediculosis	1.0
Others	1.5

Table.4. Common skin diseases

Disease	**Frequency in percent**
Contact dermatitis	12.1
Atopic dermatitis	10.2
Acne	9.1
Urticaria	6.3
P. versicolor	5.5
Hair fall	4.3
Seborrheic dermatitis	4.0
Impetigo	3.7
T. capitis	3.7
Abscess	3.6
T. pedis	3.6
Scabies	3.6
Chickenpox	2.8
Psoriasis	2.7
Wart	2.2

Day Surgery via The Internet

Maurice Brygel

In January 2004 the Melbourne Hernia Clinic published a review article in the MEJFM dealing with - "The classification of hernia, their examination and surgical management". Over the past twenty-five years the Clinic has treated well over 10,000 hernias. Surgery is performed under Local Anaesthetic and light sedation with a mesh reinforcement as a day case.

The clinic also has taken a special interest in repairing more complex cases such as incisional hernias. This is usually carried out under a General Anaesthetic. There may be an associated abdominoplasty. We will be publishing more information about this and the use of mesh in the near future.

In certain circumstances laparoscopic "keyhole" hernia repair is also available.

Mr Maurice Brygel and Mr Charles Leinkram of the Melbourne Hernia Clinic and the Sydney Hernia Centre, Australia, routinely audit their cases, and are now presenting some of the outcomes, results and observations.

Hernia Referral:

Around 2004 a hernia Website was established in the name of Melbourne Hernia Clinic - details attached: www.hernia.net.au www.sydneyherniacentre.net.au or you can just Google "hernia" and gain direct access to the Website.

This has led to an unexpected increase in referral of patients.

In 2007 out of the 410 patients operated upon approximately 1/3rd were referred via the Website. There were others who were referred by their doctor but sought further information through our Website prior to attending. Also numerous patients were seen who did not require surgery.

The majority of Internet patients rang to make a booking but many from the country, Interstate or overseas initially emailed us. We also received email requests for second opinions from patients who were having a problem, e.g. post-operative complications or difficulty getting advice. We were glad to point these patients in the right direction if possible.

We also received many emails thanking the Clinic for the information provided as it helped patients make informed decisions about their management.

We always spoke to country, interstate or overseas patients before they visited. This was to ensure that they actually had a hernia. If the patients had not noticed a lump and had been suffering from groin pain, which sounded to be of a chronic nature we informed them that this might not be a hernia. We pointed out to them that we could not guarantee to recommend surgery in these circumstances. We suggested they seek further opinions before travelling a long distance to see us.

An analysis of the patients referred because of the Website showed that more 70% were from all over Melbourne. Up to 20% were from the country and 10% from Interstate or overseas. Conventionally referred patients are mostly from a nearby locale.

The reasons given for self-referral from the Website were:

1. Wanted a Specialist in hernia repair,
2. Wanted to avoid a G/A,
3. Wanted early treatment (avoiding long waiting lists),
4. Day surgery made it affordable even if they were not insured.
5. Wanted a particular technique - in our case the Lichtenstein tension free technique with onlay mesh.
6. Some felt they wanted to make their own decision - the Internet "empowers".
7. Preferred to know whom they were actually seeing.

Patients might not have had their own regular General Practitioner and felt they know more about the Surgeon by viewing the Website.

Type of Hernias:

In 2007 there were 410 patients who had 465 hernia operations including 55 bilateral inguinal hernia repairs. They ranged in age from 15 - 93 years. A similar number were treated in 2005 and 2006.

Over 90% were inguinal. The remainder were umbilical (the commonest), epigastric, femoral, incisional, spigelian and recurrent inguinal hernias.

A small number of patients require more urgent operations after their initial consultation because of an episode of incarceration or increasing pain.

We treated very few strangulated inguinal hernias. This may be because we are more of an elective practice. However we believe the incidence of strangulation is being reduced because hernias are being treated earlier. The patients are better informed and because of the lower

risks of surgery are more agreeable to having it carried out at an early stage.

There were 15 recurrent inguinal hernias operated on. This is a decrease in number from previous years. None of the recurrent inguinal hernias were our own operations. Most of the recurrent hernias operated on did not have a previous mesh reinforcement.

Over 90% of patients were treated as a day case. Most overnight stays were for family reasons or infirmity. However age and infirmity were not a bar to day surgery as there were a high proportion of 70 to 90 year olds treated as a day case.

Most of the hernias were classified as small to moderate size and reducible. There were a significant number of irreducible hernias and hernias which descended into the scrotum. Some could have been classified as giant hernias. This only occasionally proved to be a bar to day surgery and Local Anaesthesia.

In young people the majority of inguinal hernias were indirect.

With ageing the proportion of direct inguinal hernias increased.

With indirect hernias there was often an associated lipoma protruding through the deep ring. In a significant number this lipoma - consisting of extraperitoneal fat, simulated a hernia and could not be distinguished clinically or by ultrasound from the sac of a hernia. The fat of a lipoma cannot be distinguished from intraperitoneal omentum by ultrasound. The lipomata were just like a hernia. They might cause pain and even strangulate.

Anaesthetic Technique:

Hernias were repaired using direct Local Anaesthetic infiltration and intravenous sedation. The Local Anaesthetic was a combination of Xylocaine (Lignocaine) 1-2% with Adrenaline 1 in 200,000 mixed with ½% Marcaine plain (Bupivacaine). This makes a solution of Adrenaline 1 in 400,000, a volume of 40 ccs. The recommended doses were never exceeded. The percentages were sometimes adjusted for bilateral hernias. Extra volume was obtained by using extra 0.9% Saline up to 10-15ccs. There were no adverse outcomes from the Local Anaesthetic such as arrhythmia, fits, respiratory depression or any evidence of over dosage.

The Local Anaesthetic was injected by the Surgeon after the initial dose of intravenous sedation by the Anaesthetist. The sedation was deep enough for the patient not to feel the first injection. Following this sedation was minimal and most patients were able to talk and cough during the procedure.

Each Surgeon has his particular technique and preferences for dosage, which are usually discussed with the Anaesthetist. In turn the Anaesthetist usually discusses the technique that they are going to use to ensure that there is adequate co-operation.

Conversion to a full anaesthetic occurred only on a few occasions - sometimes associated with obesity and difficult exposure particularly with a patient with extreme anxiety or restless leg syndrome, which appeared to be associated with sleep apnoea.

Surgical Technique:

a) Indirect hernia. The indirect sac is reduced or excised depending on the circumstances.

b) For direct hernias - the sac was reduced and imbricated using non-absorbable suture.

c) Lipomatas. These were always removed.

The Mesh:

A Polypropylene 3 x 6-inch mesh was used in most cases and tailored to suit each patient.

This was usually stapled into position as an onlay to form a shutter mechanism at the deep ring. A similar technique was used for both direct and indirect hernias.

Occasionally for hernias with a large deep ring, or for recurrent hernias, the mesh was rolled up into a plug to insert into the defect. Thus the repair was carried out without producing tension. A mesh plug was used routinely for femoral hernias. There were no complications from the mesh and no meshes needed to be removed. An antibiotic cover was not used for inguinal hernias routinely.

It is felt by some that the increasing use of mesh has led to an increase in numbers of chronic post-operative hernia pain syndromes. We do not appear to have encountered

this problem. As a result of the pain many different types of meshes are being advocated. We will be a publishing a review of meshes in the near future.

Meanwhile the Melbourne Hernia Clinic has been using the same type of mesh for the last twenty years - the Polypropylene onlay mesh and we have been very happy with this.

Co-Morbidities:

The ageing population and the prevalence of cardiovascular disease, implants, stents and valve problems together with patients neurological disorders have placed an increasing onus on the treating Surgeon to be absolutely sure about all medications and conditions before proceeding to surgery. We documented in our audit which patients required adjustments of medication or active assessment prior to surgery to exclude particular problems. It was found that in the over 50 year olds some

adjustment would be required in approximately 20% of cases, for example blood thinning agents or Diabetic medication.

Despite this it was found that very few patients were rejected for surgery or had a problem as a result of an oversight.

Follow up:

On the day of surgery patients are able to walk from the hospital and are driven home - often one or two hours away. The Local Anaesthetic is still in effect so there is minimal pain making transport easy.

Several patients felt faint even before surgery, on the way out of the Day Surgery, at home that night or the next day. There were no complications as a result of this. This issue is carefully explained to patients. Fainting was felt to be a vasovagal response. The incidence of this seems to be decreased as we pay more attention to avoiding this problem. Most Anaesthetists insert an intravenous line and give 1 litre of fluid (0.9% normal Saline). We feel this has a beneficial effect.

All patients contacted the Surgeon the next day on his mobile number to inform him of their progress, for reassurance and advice regarding analgesia or the dressings. All patients were reviewed within ten days of surgery. Many of the patients did not require further review. If considered necessary - for example with undue swelling, bruising or anxiety a further appointment was made.

There was virtually a zero incidence of post-operative vomiting. This was particularly pleasing in that many patients had previously vomited as a result of surgery under General Anaesthesia, and this had been or was one of the reasons they had sought us out.

Results:

Post-Operative Pain:

Oral painkillers were used. The need for parenteral medication was rare.

a) The main analgesics used were Panadeine Forte, Panadeine, Panadol or Digesic. Anti-inflammatory agents such as Neurofen or Neurofen Plus were also sometimes used in combination. Patients were warned of the constipating effects of Codeine and were told to use laxatives as required.

b) It was found that many patients required no painkillers at all following the surgery. Most patients took painkillers for one or two days, often sporadically and intermittently. It was unusual for painkillers to be needed for more than three or four days.

c) Overall the majority of patients did not feel that pain was a significant factor.

Haematomas & Bruising:

Bruising about the area was fairly common but of minimal significance. It was most pronounced with large inguino-scrotal hernias. There was an occasional haematoma, which formed. The haematomas occasionally - in less than 1% of patients, required aspiration. These usually occurred in patients with giant inguino-scrotal hernias.

The incidence of seromas with the epigastric and umbilical hernias was low.

Pleasingly the incidence of post-operative bleeding requiring surgical intervention or readmission was 0. This is particularly important in day case surgery. There was one patient who required reapplication of the dressing by a family member at night.

We believe that a thorough closure of the wound in several layers is important in preventing this problem. However we did recognise that bruising occurred in more than 1% of patients and always alerted the patients to the possibility.

The amount of post-operative swelling did surprise some patients - together with bruising. However careful explanation before and afterwards was reassuring. In these patients extra visits post-operatively were required.

Wound Infection:

An antibiotic cover was not used routinely.

The low wound infection rate of less than 1% was particularly pleasing. None of the infections led to a serious problem. In the few cases of infection Local Anaesthetic into the wound and a small nick allowed drainage, which would occur over a few days. Antibiotics were given at that time. There was no incidence of mesh complications from infections.

Femoral Nerve Block:

About one patient a year gets a femoral nerve block from the Local Anaesthetic and this means they cannot leave the Day Surgery Centre for a few hours because it is difficult to walk. No serious outcomes as a result of this problem.

Blood Thinners:

One serious problem, which could have led to a serious outcome, was a patient who had been placed on Warfarin due to cardiac problems and took twice the dose of

Warfarin by mistake for several days until the problem was realised and reversed. He did get severe bruising but interestingly there were no problems with the hernia wound.

We found that a great deal of care was needed in sorting out of the blood thinning medications. Many patients are now on Aspirin routinely and Warfarin for problems such as cardiac valve or cerebrovascular problems. Also

antiplatelet medication such as Plavix (Clopidogrel) is commonly used. We work closely with other treating Specialists in deciding the regime for managing these problems during surgery.

We no longer insist that patients cease Aspirin prior to surgery. When Warfarin or Plavix is stopped the advice may be for example - with atrial fibrillation to just stop the agents and not replace them with a low molecular weight Heparin such as Clexane. On other occasions Clexane is advised for three or four days before the procedure - not given on the day of the procedure or until that night, and then instituted again for another couple of days whilst the regular blood thinning agent is reintroduced. Some hospitals now have a hospital in home where a visit by the doctor or nurse practitioner administers the injections.

Urinary:

No patients require a urinary catheter. Despite many of the elderly patients having significant urinary problems and there being a reasonable number of young anxious males who are a potential candidate for this problem. It was felt that the use of Local Anaesthetic and early mobilisation negated against this problem.

It was noted recently in an article that all patients having a hernia repair in a particular series, had a urinary catheter inserted. We deplore the necessity for this.

Respiratory Complications:

These were exceeding unusual.

Central Nervous System Complications:

We found that the Local Anaesthetic technique and light sedation meant that there was very little confusion particularly in the elderly patients.

Cardio-Vascular Complication:

We had no problems with this despite many patients having a history of auricular fibrillation, ischaemic heart disease, stenting etc.

Bowel:

Probably the most frequent reason for an unexpected call was the patients getting constipated and becoming anxious despite previous explanation and instruction. There were no serious problems as a result of this. Reassurance and further advice regarding laxatives or even a suppository always resulted in a satisfactory outcome.

Deep Venous Thrombosis & Pulmonary Embolism:

In the last ten years there has been only one case of deep venous thrombosis and pulmonary embolism. This was in a patient who had a previous history of deep

venous thrombosis. We do not take action or preventative measures regarding deep venous thrombosis apart from having a mobile patient during the procedure and afterwards. However if there is a risk factor e.g. past history of deep venous thrombosis, normal precautions are instituted.

Conclusion:

The results for hernia repair for the year 2007 have been pleasing. They were in line with our results from the previous years 2005 and 2006.

The first aim in any surgical practice is to have a low incidence of complications. We found that this goal was achieved as exemplified by infection rate, deep venous thrombosis, acute retention of urine, respiratory, cardiovascular and bowel problems. There was a low incidence of bleeding complications.

Moreover we found that overall, recovery following surgery was excellent. There was little need for prolonged painkillers. There was rapid mobilisation and return to work. The day surgery concept was successful. We were of the opinion that the pain, rate of recovery and return to work were comparable and even superior to those attributed to keyhole surgery (laparoscopic). Two important advantages of our method are that the surgery is performed under Local Anaesthetic and the cost factor, particularly with non-insured patients.

The incidence of recurrence of inguinal hernias has been very low. As well we noted the incidence of recurrent hernias from other Surgeons had also decreased in number. We put this down to increasing use of mesh.

We found that we were pleased with these results although not every patient got back to work quickly. We did find that many people were able to get back to a sedentary type of job even after one or two days.

In future will patients be Skyping us with their interview and demonstrating their hernias from remote areas - is this the future?

The Outcome of Magnetic Resonance Imaging (MRI) on Diagnostic Decision Making in Patients with Different Clinical Conditions

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ABSTRACT

Objectives. The aim of this study was to examine the usefulness of MRI for making diagnosis and treatment decisions and find the change in the clinical management of patients.
Design: This is a prospective observational study.
Setting: The study was conducted at the outpatient department of the Hamad General Hospital during a period from January 1 to March 31, 2007.
Subjects: Five hundred and Fifty One consecutive outpatients referred for MRI by Specialists in the outpatient department of the Hamad General Hospital were included in this study.
Methods: Medical records of all patients were examined. The following details were collected, patient's age, sex, nationality, summary of all clinical findings and MRI reports.
Results: A total of 501 cases were referred for MRI. 41.9% of those patients were Qatari and 58.1% were non-Qatari. The highest proportion of patients was in the age group 35-54 years (50.9%). Male cases (56.3%) were more in number than females (43.7%). In total, the leading specialities for diagnostic referrals were neurosurgery (24%), Neurology (21.8%), Orthopedics (18.4%) and Rheumatology (10.6%). MRI evaluation of the lumbar spine was the most common anatomical region requested (31.9%), followed by the brain (28.2%), and cervical spine (16.2%). Changes in management were reported in 228 cases (45.5%).
Conclusions: The study findings revealed that MRI did not change the treatment plan in more than half of the studied cases. Referral to another speciality, change in patient medication and change of surgical approach were the common management changes which happened after MRI.

Key Words: Epidemiology. Misuse or abuse MRI. Medical conditions. Assessment. Cost effectiveness. Qatar

Introduction

Magnetic resonance imaging (MRI) is recognized as a potentially useful[1-6], although expensive[7-9] imaging technique. The continuous medical and technological progress has led to a rising use of high techology diagnostic tests. Medical technology is believed to be partially responsible for the rise in per capita health care costs. The introduction of MRI in the 1980's has considerably changed the practice of radiology. Quantitative analyses have identified radiology as a prominent cause of rising health costs[10]. For that reason many efforts have been undertaken to enhance the effectiveness and efficiency of referrals for diagnostic tests[1].

Studies have pointed out a wide range of reasons for referrals including patients' demand for extensive diagnostics. For instance, referral patterns were related to the physicians' attitudes to their role and to the interaction between the physician and patient[1]. Also the social context seems to have a high influence for referral for further diagnostics[2].

Nevertheless, the variation of referral rates remains largely unexplained. Early evaluations of its clinical benefits have been criticized recently[11-13], and its clinical efficacy still has to be rigorously shown[14-17] . Meanwhile, clinicians and managers are faced with decisions on when and how to introduce this medical technology[18].

Magnetic resonance imaging is widely accepted as an important technology in health care, but there is still

limited formal evidence of effectiveness with regard to its impact on patient management. There is relatively limited information from the literature with regard to comparative clinical impact, costs and effect on quality of life. The aim of the study was to assess the impact of MRI on diagnostic decision making and patient management at the outpatient department of the Hamad General Hospital.

Subject and Methods

This research was designed as a prospective observational study. There were 9,456 cases who underwent MRI exam in the Radiology departments of the hospitals of the Hamad Medical Corporation annually. This study included all outpatients of the Hamad General Hospital who had an MRI exam between 1 January to 31 March 2006. 550 outpatients were referred for MRI during this study period and of these patients, 501 cases' diagnostic pathways were recorded and were included to examine the usefulness of MRI (91.1%).

The Co-Investigators (Radiologists), examined the medical records of all patients to collect the details of the patients. The two Radiologists checked the extracted information and completed the missing information from the medical records. The sampling procedure and MRI cases change in management and diagnosis altered is presented in Figure 1. The documentation included age, sex, nationality, reason for referral, clinical symptoms, anatomical region for MRI, management change after MRI and previously established diagnoses of each patient. Some patients had more than one MRI during this study period.

Patient referral was through 6 different specialities, Neurosurgery, Neurology, Orthopedics, Rheumatology, ENT, Pediatrics.

Hospital records of all patients were examined to find the reason behind requesting the MRI and whether there was any change in the patient management in the out patient appointments following the MRI. Also it was used to look for other radiological work up to the same area of MRI in the previous 6 months. MRI original request and MRI schedule records as well as the Radiology Information System were used to obtain the information missing in the patient's files or in the cases we were not able to elicit. A management change after MRI results was defined as a change in patient management.

All patients were referred by specialists. All study patients received an MRI scan for initial diagnosis. The real cost per year of the MRI examination was calculated taking into account working time of health professionals, supplies, fixed overhead costs. After considering all the related variables, the real cost per MRI examination at our institution was calculated. In Qatar, medical services are free for Qataris and subsidized for expatriate residents and visitors.

Student-t test was used to ascertain the significance of differences between mean values of two continuous variables. Chi-square and Fisher exact test were performed to test for differences in proportions of categorical variables between two or more groups. The level $p<0.05$ was considered as the cutoff value for significance.

Results

Table 1 shows the characteristics of the cases who have undergone MRI examinations by nationality. A total of 501 cases were referred for MRI with 41.9% of Qataris and 58.1% non-Qataris. The mean age of males were 40.7 ± 16.4 and females were 42.2 ± 15.5 and there was no statistically significant differences between their age ($p= 0.312$). The highest proportion of cases for MRI was in the age group 35 - 54 years (50.9%). In total, the leading specialities for diagnostic referrals were neurosurgery (24%), Neurology (21.8%), Orthopedics (18.4%) and Rheumatology (10.6%). A high percentage of MRI was requested for Qataris (22.4%) by Orthopedician and in non-Qataris (27.5%), by Neurosurgeons. Lumbar spine was the most common anatomical region examined (31.9%), followed by Head (28.2%), then cervical spine (16.2%). Referral to another speciality (20.2%), change in patient medication (12.4%) and change of surgical approach (4.2%) were the common management changes recorded after MRI.

Table 2 shows the charecteristics of the cases who had undergone MRI examination by sex. Of these cases, male cases (56.3%) were higher than females (43.7%). Male cases referred for MRI were more in number for Neurosurgery (29.1% vs 17.4%), Orthopedics (19.5% vs 16.9%), and ENT (6.4% vs 4.1%), while female cases were more for Neurology (22.8% vs 20.9%) and Rheumatology (17.4% vs 5.3%). Changes in management were reported in 228 cases (45.5%).

Table 3 shows the comparison in patients referred for magnetic resonance imaging by age and sex in Qatar, United Kingdom and Australia. The proportion of MRI taken in each group in Qatar is comparable with UK and Australia.

In Qatar, the average cost calculated for MRI for neurology and neurosurgery specialities is £185/- per examination and for orthopedic referrals like cervical spine, lumbar spine is £155/- per examination.

Discussion

The current study explored the situation to examine to what extent MRI was perceived as useful for making diagnoses and treatment decisions. This study considered the role of magnetic resonance imaging (MRI) in the diagnoses in the outpatient department of the Hamad General Hospital. The principal objective was to identify

whether the use of MRI had a major impact on the clinical management of patients and whether it improved patient outcomes. Because of the impact on financial resources, the study focused on high cost imaging especially MRI scan. This is the first study undertaken in the State of Qatar on the outcome of MRI on diagnostic decision-making.

The data revealed that changes in management were reported in 228 cases (45.5%), whereas 273 cases (54.5%) had no change in management. A similar study in Bahrain[17] reported that management was changed in 27% of cases, which is considerably lower than the proportion found in the present study. Also, it is found in the study sample that procedures were deferred in 3.8% of cases and surgical approach was changed in 4.2% of cases. This result demonstrated that the use of MRI in patients reduced the need for surgery. In fact, there was a need for the surgery, but MRI channelled the patients to other subspecialities. A smaller proportion of patients in the MRI group abandoned operations (1%). Hence, the usefulness was mostly limited in operations abandoned; procedures deferred and change of surgical approach. The scan was considered useful for therapeutic planning.

As an outcome of MRI examinations, changes in medication and further referrals took place in 163 cases (32.5%); change in medication occurred in 12.4% of cases and referred to other speciality was in 20.2% of cases. Although changes in medication and further referral may be entirely appropriate outcomes of an MRI exam, for certain patients MRI was not beneficial because there was a repeated MRI for treatment decisions.

Also, the test result is often negative while the problem is persisting, physicians and patients could be both disappointed, thus leading to low perceived usefulness of high-cost imaging.

Our evaluation highlights the difficulties encountered trying to ensurie maximum clinical impact and minimal overall costs. To use magnetic resonance imaging most effectively in "a situation where restriction seems necessary"[3] it might be argued that patients need to be thoroughly investigated by conventional techniques before they are referred for magnetic resonance imaging.

A British study reported that there was no indication that patients' quality of life improved after MRI[17]. In the current study, more than half of the cases (54.5%) had no change in clinical management. In some cases, MRI improved patient outcomes.

Medical and technological progress has led to increased number of diagnostic tests, some of them inducing high fincancial costs. Generally, high cost diagnostic imaging is performed by a medical specialist after referral by a General Practitioner (GP) or specialist in Primary Health care. The average cost calculated for MRI in Qatar was £185/- for the speciality neurosurgery and £155/- for orthopedic. The average cost of scanning a patient in Qatar was relatively low because the government of Qatar charges expatriates a nominal fee for medical services and moreover, medical services are free for Qataris.

Also, the current study did not find any significant notice that MRI is efficacious with respect to patient outcomes.

Conclusion

The study findings revealed that MRI did not change the treatment plan in more than half of the patients. Referral to other speciality, change in patient medication and change of surgical approach were the common management changes observed after MRI. Lumbar spine, Head and cervical spine were the most common anatomical regions for MRI. The usefulness of MRI tests in half of the studied cases for the primary diagnoses was questionable.

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Figure 1: MRI Cases changed in management and diagnosis altered

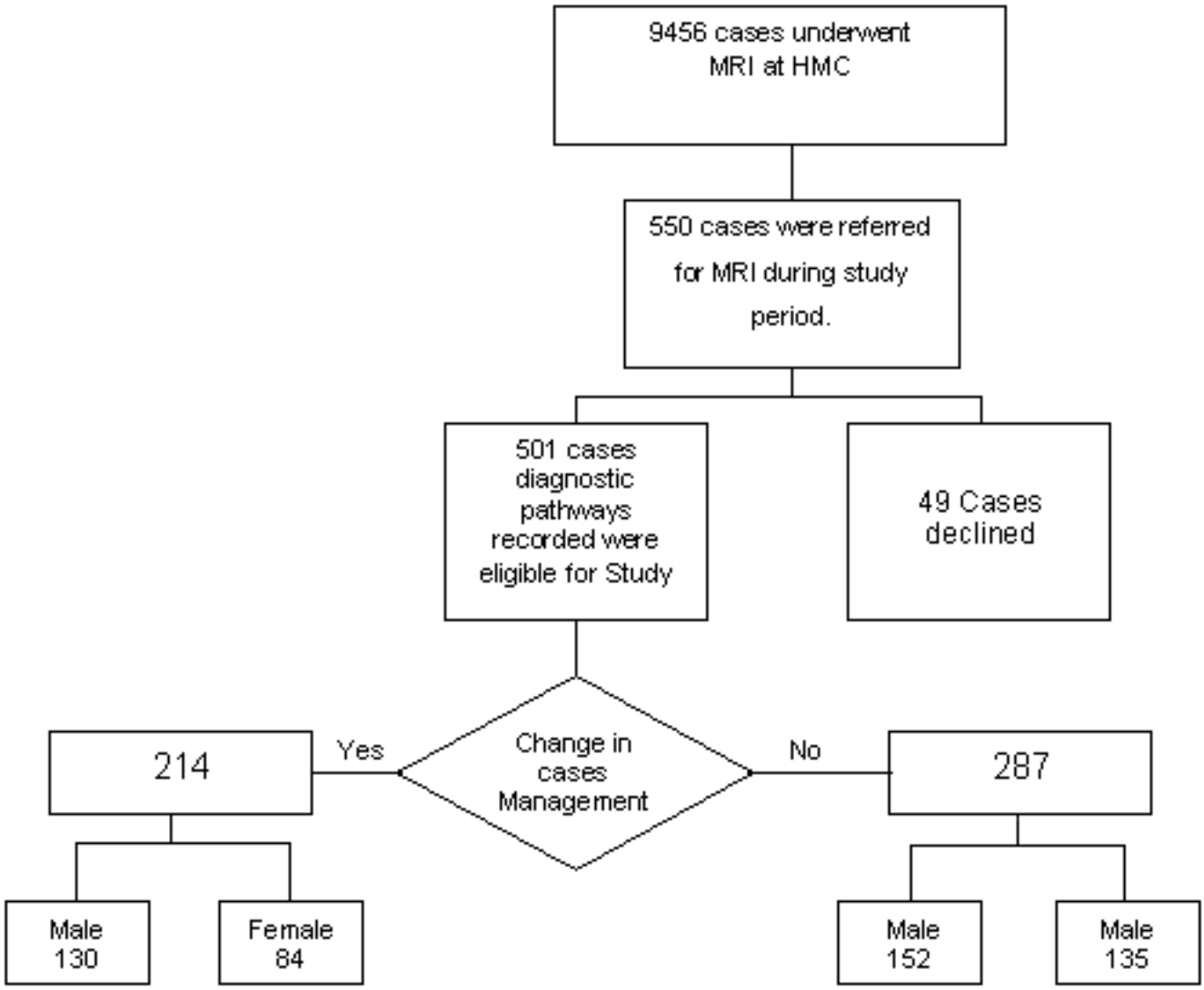

Table 1: Characteristics of the patients who had undergone for the MRI (N=501)

Variables		No. of patients		P-value
		Qatari n(%)	N.Qatari n(%)	
Gender				
	Male	95(45.2)	187(64.3)	<0.001
	Female	115(54.8)	104(35.7)	
Age Group				
	< 15 Years	19(9.0)	21(7.2)	0.032
	15-34 Years	55(26.2)	53(18.2)	
	35-54 Years	91(43.3)	164(56.4)	
	>=55 Years	45(21.4)	53(18.2)	
Specialty				
	Neurosurgery	40(19.0)	80(27.5)	0.006
	Neurology	39(18.6)	70(24.1)	
	Orthopedics	47(22.4)	45(15.5)	
	Rheumatology	26(12.4)	27(9.3)	
	ENT	17(8.1)	10(3.4)	
	Pediatrics	17(8.1)	14(4.8)	
	Others	24(11.4)	45(15.5)	
Anatomical Region for MRI				
	Lumbar Spine	65(31.0)	95(32.6)	NS
	Cervical Spine	32(15.2)	49(16.8)	
	Thoracic Spine	4(1.9)	6(2.1)	
	Head	54(25.7)	87(29.9)	
	Sella	7(3.3)	10(3.4)	
	Extremities	39(18.6)	38(13.1)	
	Others	9(4.3)	6(2.1)	
Reason for MRI				
	Diagnosis	56(27.1)	68(23.6)	NS
	Symptoms	126(60.9)	195(67.7)	
	Follow-up	25(12.1)	25(8.7)	
Management Change after MRI*				
	Operations abandoned	1(20.0)	4(80.0)	
	Procedures deferred	4(21.1)	15(78.9)	
	Change of surgical approach	4(19.0)	17(81.0)	
	Change in patient medication	22(35.5)	40(64.5)	
	Referral to other sub-specialty	39(38.6)	62(61.4)	
	Other	11(55.0)	9(45.0)	

* Multiple options

Table 2: Characteristics of the patients who had undergone MRI (N=501)

Variables		No. of patients		P
		Male n(%)	Female n(%)	
Nationality				
	Qatari	95(33.7)	115(52.5)	<0.001
	Non-Qatari	187(66.3)	104(47.5)	
Age Group				
	< 15 Years	23(8.2)	17(7.8)	NS
	15-34 Years	67(23.8)	41(18.7)	
	35-54 Years	137(48.6)	118(53.9)	
	>=55 Years	55(19.5)	43(19.6)	
Specialty				
	Neurosurgery	82(29.1)	38(17.4)	<0.001
	Neurology	59(20.9)	50(22.8)	
	Orthopedics	55(19.5)	37(16.9)	
	Rheumatology	15(5.3)	38(17.4)	
	ENT	18(6.4)	9(4.1)	
	Pediatrics	17(6.0)	14(6.4)	
	Others	36(12.8)	33(15.1)	
Anatomical Region for MRI				
	Lumbar Spine	88(31.2)	72(32.9)	NS
	Cervical Spine	43(15.2)	38(17.4)	
	Thoracic Spine	8(2.8)	2(0.9)	
	Head	81(28.7)	60(27.4)	
	Sella	8(2.8)	9(4.1)	
	Extremities	44(15.6)	33(15.1)	
	Others	10(3.5)	5(2.3)	
Reason for MRI				
	Diagnosis	73(26.0)	51(23.8)	NS
	Symptoms	180(64.1)	141(65.9)	
	Follow-up	28(10.0)	22(10.3	
Management Change after MRI*				
	Operations abandoned	3(60.0)	2(40.0)	
	Procedures deferred	13(68.4)	6(31.6)	
	Change of surgical approach	14(66.7)	7(33.3)	
	Change in patient medication	29(46.8)	33(53.2)	
	Referral to other sub-specialty	68(67.3)	33(32.7)	
	Other	11(55.0)	9(45.0)	

* Multiple options

Table 3. Age an d sex of patients referred for magnetic resonance imaging

	International comparisons				
Age (years)	**Qatar**			**United Kingdom[11]**	**Australia[4]**
	Females	**Males**	**Both Sexes***	**Both sexes**	**Both sexes**
	(N=3368)	**(N=4535)**	**(N=7903)**	**(N=936)**	**(N=16178)**
	n(%)	**n(%)**	**n(%)**	**n(%)**	**n(%)**
<1	56(1.7)	63(1.4)	119(1.5)	1(<I)	1(<1)
1-9	121(3.6)	163(3.6)	284(3.6)	25(3)	647(4)
10-19	193(5.7)	257(5.7)	450(5.7)	74(8)	1617(10)
20-29	404(12.0)	656(14.5)	1060(13.4)	117(13)	2427(15)

30-39	763(22.7)	953(21.0)	1716(21.7)	183(20)	3074(19)
40-49	904(26.8)	1158(25.5)	2062(26.1)	225(24)	3074(19)
50-59	594(17.6)	812(17.9)	1406(17.8)	186(20)	2264(14)
60-69	229(6.8)	328(7.2)	557(7.0)	94(10)	1941(12)
70-79	94(2.8)	116(2.6)	210(2.7)	28(3)	971 (6)
80-89	10(0.3)	29(0.6)	39(0.5)	3(<1)	162(1)

*Qatar 43% Female; Australia 49% female; Coventry 54% female.

The Role of Tru-Cut Biopsy in Reaching Definitive Diagnosis of Breast Cancer

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ABSTRACT

The aim of this study is to evaluate the importance of tru-cut biopsy in reaching a definitive diagnosis of breast cancer in suspicious breast lumps in outpatient settings.

Furthermore, the aim was to evaluate the diagnostic usefulness of further histopathological details obtained with tru-cut biopsy, and its effect on preoperative planning of surgical treatment.

A total of 175 women who presented from July 2006 to December 2007 with clinically suspicious breast lump at breast clinic were included in this prospective study.

The triple assessment approach: clinical, radiological and histopathological was applied; after detailed history, physical examination and mammography, tru-cut biopsy was performed in an outpatient setting, surgery was done for patients diagnosed to have breast cancer.

The findings of this study showed that the sensitivity of tru-cut biopsy was 97%, and specificity near 100%; tru-cut biopsy is very accurate in confirming breast cancer in suspicious lumps, and it is able to give definite histology of the lesion, with low cost and low complication rates; 2% developed minimal bruising. Furthermore it gives information about the intrinsic behavior of the tumor: type, grade, lymph, vascular invasion, and receptors status, also it permits the eventual use of preoperative adjuvant therapy. Modern surgical strategy requires a pre-operative planning of surgical and oncological treatment, which is possible through the use of core biopsy that permits the study of both architectural and cytological patterns.

Key words: breast cancer, breast lumps, fine needle aspiration cytology, tru-cut biopsy.

Introduction

Presenting symptoms to breast clinics include: lumps, nipple discharge, mastalgia and skin changes. Of them Breast lump is the most common presenting symptom to the breast clinic. In this study 175 patients presented to the breast clinic with suspicious palpable breast masses.

Despite the wide use of fine-needle aspiration cytology (FNAC) for palpable breast masses, many surgeons are reluctant to accept FNAC reports as a basis for definitive diagnosis. FNAC reports still have percentage of uncertainty, and also lack important information about the histopathological type, grade, receptors, and intrinsic behavior of the tumor. All of this information is of great importance for correct preoperative evaluation by both surgeon and oncologist.

The tru-cut biopsy of palpable breast lesions based on histological study of tissue specimens can provide all the reliable information to guide the surgeon and the oncologist for an ideal modern therapeutic strategy in surgical decision making.

Also it permits the eventual use of neoadjuvant therapy.

Patients and Methods

A total of 175 women who presented from July 2006 to December 2007 with clinically suspicious breast lumps at breast clinic were included in this prospective study.

Triple assessment approach: clinical, radiological and histopathological was used for these patients. After a detailed history and physical examination, and mammography, tru-cut biopsy was performed in an outpatient setting.

The core biopsy was performed by using a Tru-cut gun with an 18-gauge needle.

After manual localization and immobilization of the lesion, under a complete aseptic technique, a 2%

Lidocaine infiltrating anesthetic was administered, and the skin incision was performed. A biopsy specimen was obtained by means of four successive insertions with different angulations of the needle into the lesion core. The quantity and quality of the material obtained was judged after immediate immersion of the specimen in fixative, and then specimen was sent to the histopathology department.

After evaluation of results by a team composed of a consultant breast surgeon, oncologist, radiologist, and a pathologist, patients diagnosed to have breast cancer were presented with the advantages and disadvantages of each treatment and subsequently decided on the definite therapeutical treatment.

Surgical procedures utilized were modified radical mastectomy, wide local excision. Neoadjuvant chemotherapy was used for down staging of locally advanced inoperable tumors.

Tru-cut biopsy reports were compared with the final histopathology report obtained after surgery.

Results

Out of a total of 175 patients who presented with suspicious breast lump, 72 patients had carcinoma of the breast. The patients ranged in age from 30 years to 73 years. The mean size of the breast lump was 3.8 cm in diameter with a range of 1.5 cm to 12 cm.

Tru-cut biopsy confirmed the diagnosis of breast carcinoma in 70 patients. The remaining two patients required excisional biopsy for confirmation. There were no false positive results, with sensitivity 97% and specificity 100%. Also it gave the definitive histological type and grade which correlated with the final histopathology report in 69 out of the 70 patients. Other important informationwas revealed including multicentricity and the immunohistochemistry of the tumor, which enabled us to use neoadjuvant therapy for down-staging of advanced tumors. There were no remarkable complications apart from minimal bruising in 2% of patients.

Discussion

Despite the wide use of fine-needle aspiration cytology (FNAC) for palpable breast masses, it has not achieved improvement in the pre-surgical decision-making and management process by both the surgeon and the oncologist[1].

The development in patient education and screening programs have permitted a marked increase in the number of tumors detected, thereby increasing the use of FNAC procedures[2]. However many surgeons are reluctant to accept FNAC reports as basis for definitive diagnosis[3].

Various studies have been done to determine the efficacy and usefulness of both FNAC and tru-cut biopsy; and the results vary. FNAC has been found to have a sensitivity ranging from 84% to 97.5% and a specificity of more than 99% to 100%. Tru-cut biopsy was reported to have a sensitivity of around 90% and a specificity of 100%. However, various authors have differing opinions on which method is better and there is no consensus in their recommendations[4,5,6].

Masood[1] and Smith[7] use surgical biopsy to confirm cytologically negative and suspicious cases and directly operate only on those cases with positive cytologic diagnosis. On the contrary, Ciatto[8] requires histological confirmation for suspicious and positive aspirations and does not treat either negative cases or eventual false negatives.

The ideal approach for women with suspicious breast lump is the triple assessment approach including clinical, cytology, and mammography[9], but this assessment is not sufficient for decision of treatment[10], because FNAC reports still have percentage of uncertainty, also lack important information about the histopathological type, grade, receptors, and intrinsic behavior of the tumor. All of these information's are of great importance for correct preoperative evaluation by both surgeon and oncologist[4].

The sensitivity of the mammographic examination was very poor. Mammography was judged reliable in 50% of lesions larger than 2 cm, while for smaller lesions (up to 1 cm), the percentage of positivity decreased to 35%. This result is probably due both to the diverse skill of the radiologist and to the heterogeneity of mammographic instruments. many studies confirms the usefulness of a systematic use of core biopsy for diagnosis of breast cancer, even if good quality clinical, radiological, and histological examinations together are also important to obtain optimum results[11].

The tru-cut biopsy of palpable breast lesions based on histological study of tissue specimens can provide all the reliable information's, Core biopsy permits a preoperative knowledge of the histological type and prognostic parameters (receptor status, proliferative activity, ploidy,

and expression of oncogenes and antioncogenes such as c-erbB-2 and p53), so tru-cut biopsy will guide the surgeon and the oncologist for ideal modern therapeutic strategy in surgical decision making[5,10], also it permits the eventual use of neoadjuvant therapy[4].

The sensitivity, specificity, and diagnostic efficacy obtained in our study by tru-cut biopsy were comparable to those obtained with FNAC and to those reported in literature. The high efficacy of core biopsy obtained in our study of palpable lesions, in addition to its simplicity and safety, might also offer a new management strategy for patients with nonpalpable lesions with the use of ultrasound-guided core biopsy.

With ultrasound-guided techniques[12], it can be considered a safe alternative both to lumpectomy and intraoperative biopsy, which should be avoided in nonpalpable lesions.

The core biopsy was well tolerated by patients, easy to perform, relatively inexpensive and suitable for use in outpatient clinics[10].

Conclusion

Tru-cut biopsy is accurate tool in the definitive diagnosis of breast cancer, tru-cut biopsy was able to give histological diagnosis and results correlated 100% with final histopathology report, with further information about tumor type, grade, lymph vascular invasion, and receptors status, also it permits the eventual use of preoperative adjuvant therapy.

Modern surgical strategy requires a pre-operative planning of surgical and oncological treatment, which is possible through the use of core biopsy that permits the study of both architectural and cytological patterns.

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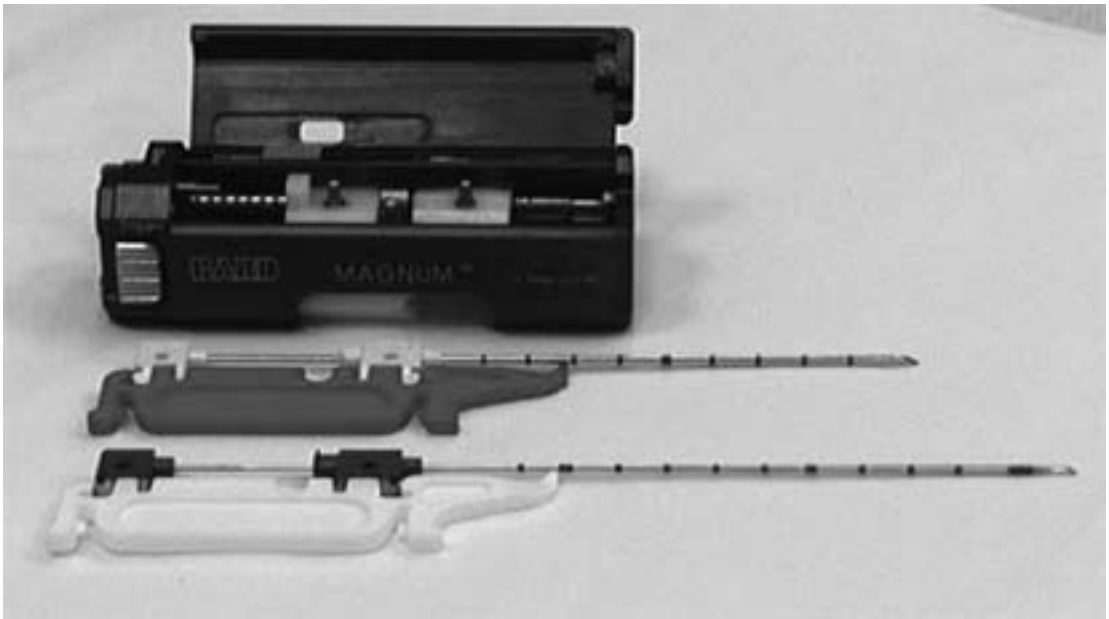
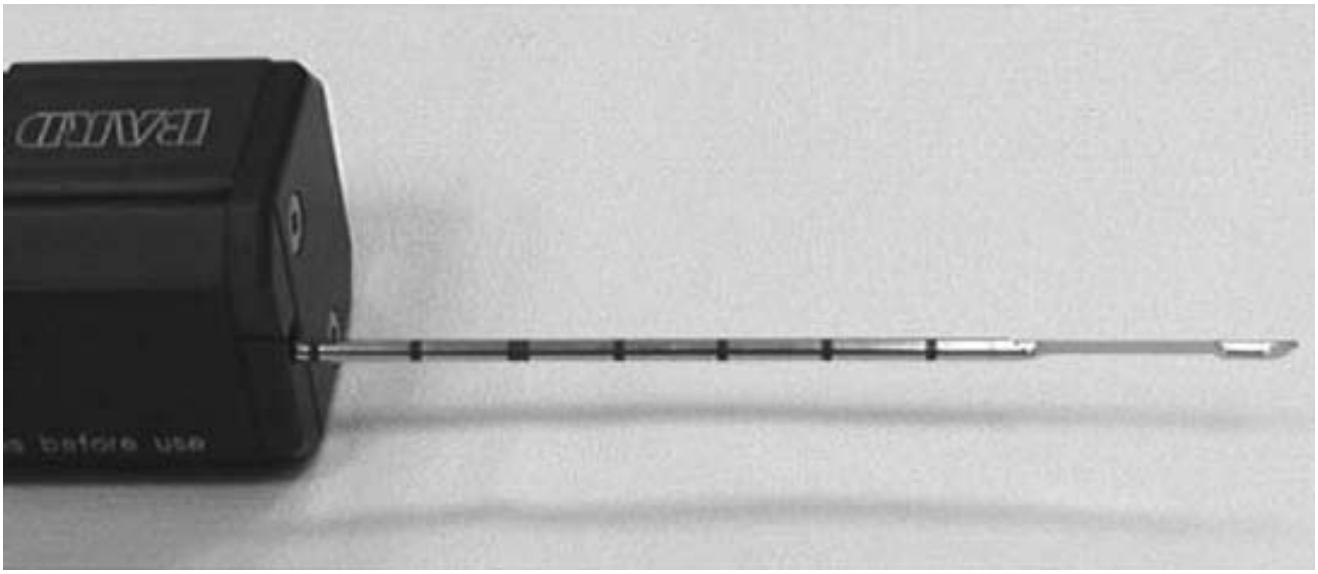
The Tru-cut gun with an 18-gauge needle.





Tru-cut biopsy reports were compared with the final histopathology report obtained after surgery.