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Case Study

Giant Cerebral Cavernoma: A Case Study

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Abstract

Background: Cavernoma is known as cavernous malformation or cavernous angioma. It accounts for 0.5% of brain mass lesions. Giant cavernomas of the central nervous system is quite rare, only 65 cases of cerebral giant cavernous angioma have been included in literature over the last 62 years. They are more common in children and may be misdiagnosed as other intracranial neoplasms. This study presented a very rare giant cavernoma extended from right basal ganglia to the sylvian fissure in a 7-year-old female.

Case description: A 7-year-old female presented with the new onset of recurrent attacks of seizures, with progressive left-sided hemiplegia for the last month. The clinical examination showed that the patient was sleepy and had left-sided hemiplegia. A non-contrast CT scan revealed a spherical slightly hyperdense intraaxial lesion at the right basal ganglia extended to the sylvian fissure measuring 5x4.5x5 cm surrounded by moderate perifocal edema. A brain CT scan, with contrast, revealed slight patchy enhancement. MRI revealed a single large lesion occupying the right basal ganglia extended to the sylvian fissure measuring 5x4.5x5 cm and showed a patchy enhancement. The patient underwent craniotomy through the right fronto-temporal and transsylvian approach, under surgical microscope, with total en bloc resection of lesion. The histopathologic examination revealed cavernous hemangioma (cavernoma). After surgery, she was conscious alert, with no new neurological deficit apart from the pre operation Left-sided hemiplegia. The postoperative follow-up was uneventful with a significant improvement in her left-sided hemiplegia after 3 months.

Conclusion: Pediatric giant cavernous angioma is a rare intracranial lesion that may be best diagnosed with MR/CT, but sometimes, confirmation requires histopathological examination. It should always be included in the differential diagnosis of spontaneous intracerebral hemorrhages or large tumor. The best outcomes correlate with surgical excision, but may be, limited by eloquent tumor location.

In our case, we report a rare case of giant cavernoma that was completely removed by microsurgical treatment. This case provides important points for the practicing neurosurgeon to consider when making a differential diagnosis of large intracranial tumors. Since imaging appearance of giant cavernoma is variable, the possibility of cavernoma should be considered in the case of a large tumor.

Keywords: Cavernoma, cavernous malformation, cavernous angioma, hemiplegia, seizure.

Introduction

Cavernoma, also known as cavernous malformation (CM) or cavernous angioma, is a benign occult vascular lesion, characterized by the presence of sinusoid-like capillary vessel containing blood in very sluggish circulation [1] that may occur in the CNS as well as in other organs such as the liver or skin [2,3]. The CNS cavernoma accounts for 5-13% of all intracranial vascular anomalies, 70–80% are supratentorial [4] and they vary in size from a few millimeters to a few centimeters in diameter [3,5]. However, giant cavernomas defined by Kan et al. [6] as a cavernoma with a diameter greater than 4 centimeters (cm) on preoperative MRI.

Most CMs are small and remain asymptomatic for long periods. Occasionally, supratentorial CMs precipitate the new onset of seizures and headaches, while infratentorial CMs more typically lead to acute/progressive neurological deficits [7, 8].

Few giant CMs (GCMs) have been reported in the literature and may mimic intracranial neoplasms or other vascular malformations. In this study, the Recently we experienced a case of cerebral giant cavernous malformation with a diameter of 5*4.5*5cm. In this study, the clinical, radiological features, the surgical

management, and prognosis of this vascular malformation are described.

Case description

A 7-year-old female presented with the new onset of recurrent attacks of seizures, with progressive Left-sided hemiplegia for the last month. The clinical examination showed that the patient was sleepy and had left sided hemiplegia. A non-contrast CT scan revealed a spherical slightly hyperdense intraaxial lesion at the right basal ganglia extended to the sylvian fissure measuring 5x4.5x5 cm surrounded by moderate perifocal edema (Figure 1A). A brain CT scan, with contrast, revealed slight patchy enhancement (Figure 1B).

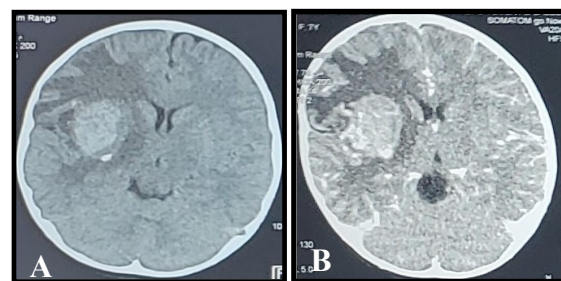


Figure 1: (A) Non-contrast CT scan revealed a spherical slightly hyperdense intraaxial lesion at the right basal ganglia extended to the sylvian fissure measuring 5x4.5x5 cm surrounded by a moderate perifocal edema and (B) Brain CT scan with contrast revealed slight patchy enhancement.

MRI revealed a single large lesion occupying the right basal ganglia extended to the sylvian fissure measuring 5x4.5x5 cm and showed an isointense signal on T1-weighted image (Figure 2A) and heterogeneous signal on T2-weighted images with peripheral hypointense rim (Figure 2B), with contrast, show patchy enhancement (Figure 2C).

The patient underwent craniotomy through the right fronto-temporal and transsylvian approach, under surgical microscope, which revealed a large dark brownish mass (Figure 3) with distinct margins from the surrounding tissues accompanied by gliosis. The lesion was totally resected en bloc with good control of bleeding (Figure 4),

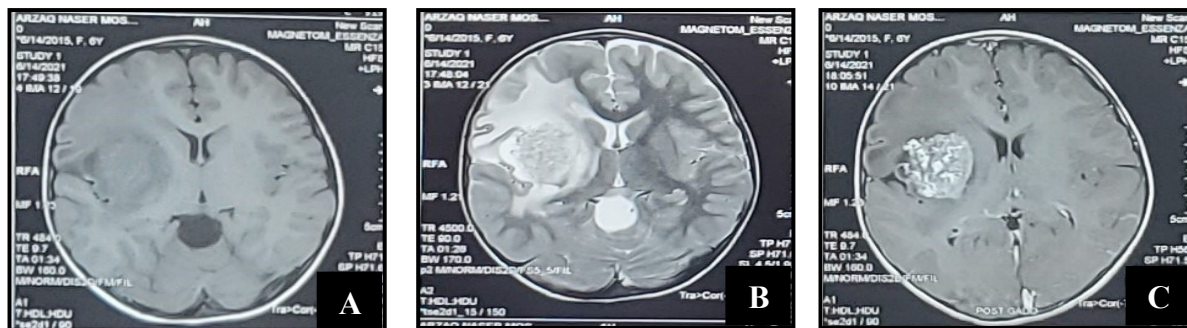


Figure 2: (A) T1-weighted MR image shows isointense signal, (B) T2-weighted MR image shows heterogeneous signal, and (C) contrast T1 weighted MR image shows patchy enhancement.



Figure 3: Dark brown cavernoma after en bloc excision.

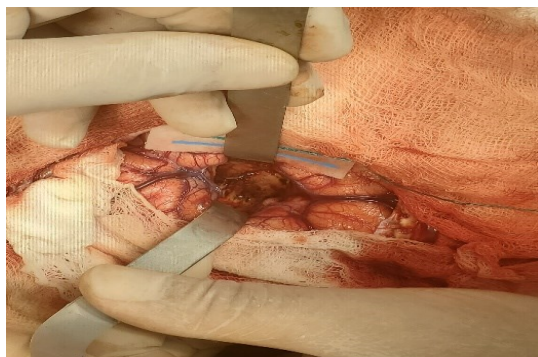


Figure 4: Cavity of tumor through the sylvian fissure.

and a follow-up CT-scan confirmed the total removal (Figure 5). The histopathologic examination revealed a multiple variable sized thin wall, and dilated blood vessels lined by endothelium resulting in cavernous hemangioma (cavernoma) (Figure 6).

After surgery, she was conscious alert, with no new neurological deficit apart from the pre operation left-sided hemiplegia. The

postoperative follow-up was uneventful with a significant improvement in her left-sided hemiplegia after 3 months.



Figure 5: Post operation control brain CT.

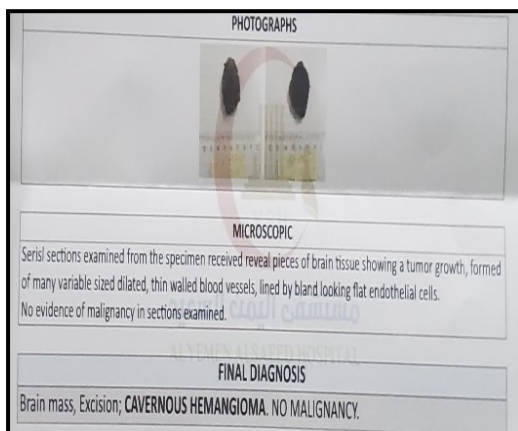


Figure 6: Histopathology contain description of cavernoma.

Discussion

Cavernoma, also known as cavernous angioma or cavernous malformation, is occult vascular benign malformations of the central nervous system [4]. It varies in size from a few millimeters to a few centimeters in diameter [3, 5]. However, a giant cavernoma is defined by Kan et al. [6] as a cavernoma with a diameter greater than 4 centimeters (cm) on preoperative MRI. In 2004, Lawton et al. defined a giant cavernous angioma as a lesion with a diameter over 60 mm [9]. CMs account for approximately 0.5% of brain mass lesions [8], and approximately 5 to 10% of all vascular malformations [10-13]. Only 65

cases of cerebral giant cavernous angiomas have been included in literature over the last 62 years and since the first case of Penfield et al. in 1948 [14]. At least half of them have been reported from 2008 to date. Jhawar et al. [8] reviewed 16 cases of giant cavernomas in all age groups but ranging in size from 4 cm and 6 cm. All lesions were reported as solitary and most frequently were found in the supratentorial white matter [4] (e.g., parietal lobe and thalamus) [8]. Our case study was found in the right basal ganglia extended to the sylvian fissure.

Cavernous angiomas have become more common and frequent in adults in the last two to four decades, but some researchers advocated that a quarter of cavernous angiomas are seen in the pediatric population [15]. While 59.4% of giant cavernomas occur in the pediatric population (less than 15 years old), in our case the patient was in the age of 6 years.

Growth and Size of Cavernoma

Cerebral cavernomas are typically 9–20 mm in size, and rarely attain larger dimensions. The mechanism by which they enlarge is probably repeated intralesional micro hemorrhages followed by the organization of the clot, pseudocapsule formation, and secondary enlargement [3,6,16]. However, it was also reported that CMs can show expansible growth without any evidence of a hemorrhagic event and mimic neoplasm [17].

The large size of the cavernoma in our case may be explained by the means of this hypothesis.

There is also a possibility of accelerated growth due to hormonal changes during puberty and pregnancy [2, 3].

Epidemiology

Although patients with CMs typically were presented between the last two to four decades [1,18,19], some researchers advocated that a quarter of cavernous angiomas are seen in the pediatric population [15]. The majority of giant cavernomas have occurred in children, with the youngest one being 3.5 months of age [20,24]. The overall prevalence among males and females is equal in the majority of cavernomas [1,11], but in giant cavernomas, there seems to be a female preponderance [24]. In our case study, the patient is female.

Familial cavernomas account for 20% to 50% of patients presenting with cavernomas [10], which is prone to be more symptomatic, likely due to the higher incidence of multiple lesions in these patients and the propensity for the novo cerebral cavernous malformation formation. In the review of giant cavernomas, no familial occurrence has been reported [24]. Multiple cavernomas may occur in 10% to 30% of sporadic cases and in up to 84% of familial cases [25], but it was not reported in any of the giant cavernomas [24].

For our patient, there was a single cavernoma with a negative familial cerebral cavernomatosis history.

Clinical Presentation

The most common symptoms of a cavernoma are seizure (ranging from 30-70% of cases) [6], followed by

neurological deficit, hemorrhage, and headache [3]. Usually, the presentation of the giant cavernoma is not different from that of usual cavernomas [24-26]. Our case also presented with seizure and progressive neurological deficit. Yet, the presentation of large intracranial mass with signs of increased intracranial pressure in children was reported in some cases [21,23]. Hemorrhage of the cavernoma is reported to be 8% to 37% in adults and 36% to 78% in children [27]. However, true hemorrhage occurrence is relatively rare in giant cavernoma [9, 20, 24].

The risk of hemorrhage has been estimated at 0.7-1.1% per lesion per year [2, 7]. Fatal outcomes due to hemorrhage from cavernoma angioma are rare [5]. Most of the time, this extralesional hemorrhage is not immediately devastating [6], but there is a high risk of rebleeding with intervals ranging from weeks to years and may lead to catastrophe [3].

CT and MRI Appearance

On CT scan, giant cavernomas often present punctate or large calcification, and the mass effect is usually less than expected for the size of the lesion [3, 6, 7]. In our case, the right basal ganglia which extends to the sylvian fissure was isodense on CT scan with heterogeneous enhancement.

Typically, the MR imaging (MRI) appearance of a giant cavernous angioma is a heterogeneous “bubble of blood” which is named “popcorn-like” mass with/without cysts reflecting various states of degradation of blood [28], with a hypointense rim of hemosiderin on T2

weighted images, is nearly pathognomonic [6,7,16]. However, MRI variability is frequent [3,6,16]. Moreover, gradient echo MRI is useful to exclude other small cavernomas that may be occult on T1 and T2-WI.

Cavernomas usually have little or no surrounding edema nor mass effect [26,29]. Cavernoma may rarely be in the form of cystic growth with a well-defined capsule [29].

On the other hand, diagnosis may be challenging in giant cavernoma, which are rare lesions [26]. Imaging appearance of giant cavernoma is variable, ranging from completely cystic lesion [21, 23] to those resembling neoplasms with striking contrast enhancement and mass effect [21,24], and finally to the heterogeneous lesion with peripheral hemosiderin rim and without significant contrast enhancement and mass effect [26]. In our case, there was significant mass effect and patchy enhancement of cavernoma as discussed above.

Differential Diagnosis

The differential diagnosis of cavernoma includes not only pilocytic astrocytoma, hemorrhagic metastasis [4,17], low-grade or malignant cystic glioma, primitive neuroectodermaltumor, oligodendroglioma, or thrombosed arteriovenous malformation, but also spontaneous intracerebral hematoma [3, 7, 16]. In many instances, the final diagnosis of cavernous angiomas is based on histopathological examination.

Histopathological Appearance

The histopathological examination shows abnormally dilated blood vessels lined by a

single endothelium layer without mural muscular or elastic fibers embedded within a matrix of collagenous tissue [8]. These vessels are in contact with each other without any intervening neural tissue and with no direct communication of the arterial with the venous system [3]. The vessels are separated by fibrotic tissue containing foci of calcification with hemosiderin deposition [3, 6], gliosis, and sometimes calcification or thrombosis eloquent [8].

Management

Surgical excision is the treatment of choice for cavernoma with recurrent hemorrhage, progressive neurologic deterioration, and intractable epilepsy, located accessible, non-eloquent [3], unless the location is associated with unacceptably high surgical risk [1,11]. The management of less accessible, deep cerebral, and brainstem lesions increasingly require stereotactic radiosurgery [3, 7], but the efficiency of radiosurgery for cavernous angioma remains uncertain. Thus, the surgical approach was justified in our case. According to many researchers, small cavernomas located in eloquent area or asymptomatic patients require observation [3, 6], however, there is no clear guideline for giant cavernoma in these cases as far as all the 65 cases were symptomatic.

Complete surgical removal should be attempted when the operation is considered [3].

Despite the large size of giant cavernoma, good surgical outcomes also have been reported in the literature of giant cavernoma [22, 23].

In our case, a complete removal was accomplished without post operation complication or new neurological deficit. In addition, the neurological deficit is improved after 3 months of physiotherapy post operation.

Conclusion

Pediatric giant cavernous angioma is a rare intracranial lesion that may be best diagnosed with MR/CT, although, sometimes, confirmation requires histopathological examination. It should always be included in the differential diagnosis of spontaneous intracerebral hemorrhages or large tumor. The best outcomes correlate with surgical excision but may be limited by eloquent tumor location.

In our case, we reported a rare case of giant cavernoma that was completely removed by microsurgical treatment. This case provides important ideas for the practicing neurosurgeon to consider when making a differential diagnosis of large intracranial tumors. Since imaging appearance of giant cavernoma is variable, the possibility of cavernoma should be considered in the case of a large tumor.

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Case Series Study

Effect of Pulse Steroid Therapy on Visual Acuity and Fundus Picture in Cases of Vogt Koyanagi Harada Syndrome in Yemen: Case Series Study

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Abstract

Vogt-Koyanagi-Harada syndrome (VKHS) is a rare systemic disease with severe bilateral panuveitis associated with cutaneous, neurological, and auditory abnormalities. This study aims to evaluate the effect of pulse steroid therapy on the visual acuity and fundus picture of cases of VKHS presented at Maghrabi Eye Hospital in Yemen. Method: This retrospective case series was followed up for three years between (2007-2010) for three female patients who presented by bilateral hand motion and complained with headache, neck stiffness and difficulty in hearing. Results: After pulse steroid therapy, the best corrected visual was improved with resolution of optic disc swelling and serous retinal detachment detected by optical coherence tomography (OCT). One eye had complication as sunset glow and suprarational fibrosis. Conclusion: VKHS is uncommon disease in Yemen and affects mostly female. Urgent intervention with pulse steroid therapy and systemic corticosteroid and early diagnosis decrease the complications and improve the visual acuity.

Key words: Vogt Koyanagi Harada syndrome, pulse steroid therapy, visual outcome, Yemen.

Introduction

VKHS is a rare systemic disorder involving various melanocyte-containing organ systems, including the eyes, ears, skin, and meninges (1). Although VKH has been reported throughout the world, its appearance seems to be concentrated in certain racial and ethnic groups

predominantly in Asians, Hispanics, and Native Americans (2). In the 12th century, a physician from the Arab world, Mohammad-al-Ghafiqi, described a disease with poliosis, neuralgias, and hearing changes (3). Alfred Vogt presented one instance in 1906 (4), Harada documented one case in 1923, and in 1926, a case of basically posterior uveitis with an

exudative retinal detachment connected to pleocytosis in the cerebrospinal fluid was described (CSF) (3). Six cases with bilateral nontraumatic chronic iridocyclitis linked to polio and vitiligo were described in great detail in 1929 (5). It was already well known that the symptoms of Vogt-Koyanagi syndrome and Harada's illness were very similar. The term Vogt-Koyanagi-Harada disease (syndrome) was first used in the majority of published publications in 1970, and by 2003, most authors had accepted it (6). VKHS involves the eye causing severe bilateral panuveitis associated with cutaneous, neurological, and auditory abnormalities. It initiates with a prodromal stage that lasts for a few days and is characterized by a viral-like illness that is frequently accompanied by headache, stiff neck, and confusion, followed by an acute uveitis stage which lasts for a few days and is characterized by the development of bilateral diffuse choroiditis, papillitis, and exudative retinal detachment (7). Most cases of VKHS were presented firstly to neurologists and symptoms that are related to eye were presented later (8). Thus, making the diagnosis of VKHS is very difficult. In the opposite, early medical treatment is mandatory to recover fast and to safe the vision (5). The etiologic and pathogenic factors in VKHS remain unclear (9). The major histopathologic feature of VKH is a diffuse granulomatous inflammation of the uveal tract with a preponderance of lymphocytes and epitheloid cells (10). The choriocapillaris are usually, but not always, involved. In the late stage, there are disappearance of choroidal melanocytes, chorioretinal scarring and occasionally

choroidal neovascularization (11). When it is first diagnosed, VKHS usually responds to oral or intravenous high-dose corticosteroid therapy. Early treatment can benefit in preventing disease progression to later stages of its natural course (7). When corticosteroids are contraindicated due to a systemic underlying disease (such as diabetes), immunosuppressive therapy can be added to the regimen of treatment for VKH at various stages of the disease to increase the potency of corticosteroid therapy and decrease the overall dosage of corticosteroid therapy required to control the disease (12). Recently, several authors suggested using immunosuppressive medications in the very early stages of the disease (13) to lessen relapses and stop the development of sunset glow fundus, which may be linked to impaired visual function even when good visual acuity is still present (7).

In Yemen, there is no research about VKHS which is a rare disease and mostly affect women (14). Therefore, this study aimed to describe Effect of pulse steroid therapy on visual acuity and fundus picture in cases of Vogt Koyanagi Harada Syndrome presented to Maghrabi Eye Hospital, Sana'a, Yemen.

Case Presentation

Method

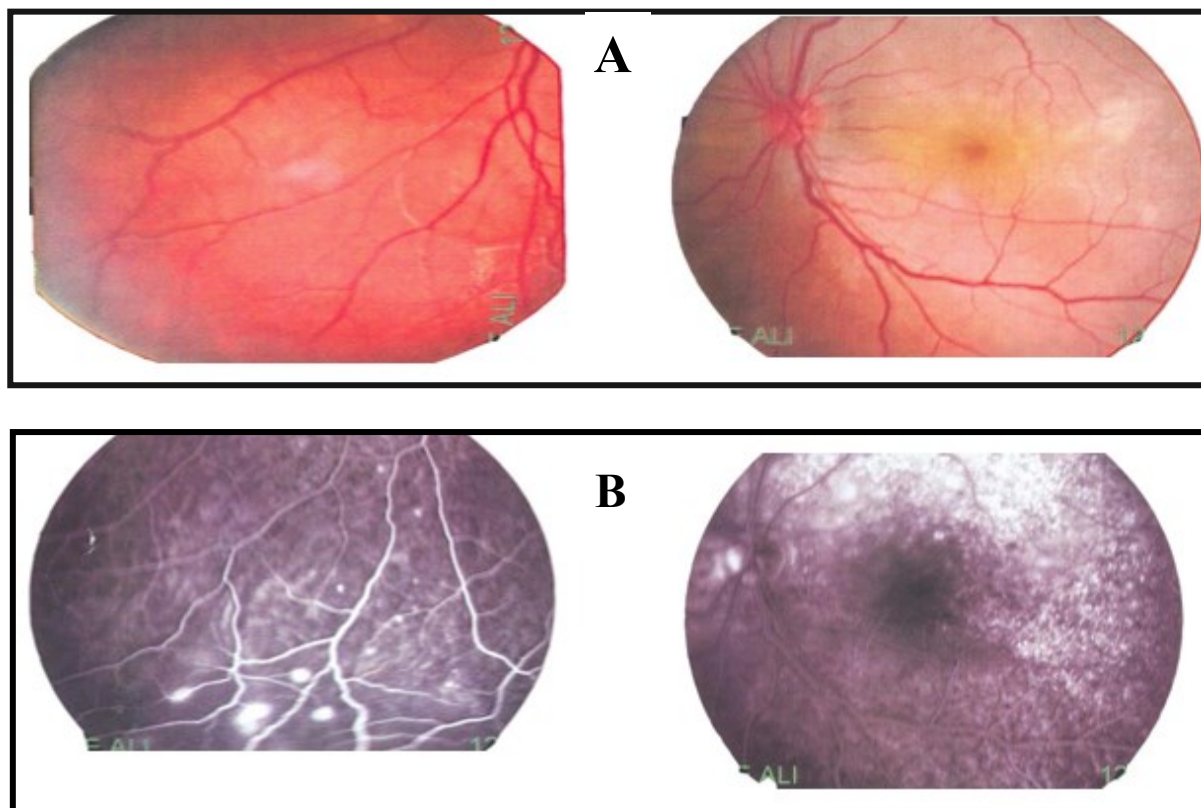
Three female patients ranging between 20-50 years old were admitted to Maghrabi Eye Hospital in Yemen with bilateral poor vision, headache, neck stiffness and difficulty in hearing, denied comorbidities or other systemic symptoms. Ancillary exams for infectious diseases including serologies for syphilis (FTA-Abs and

VDRL), HIV, tuberculosis and toxoplasmosis, chest X ray and Mantoux test were ordered, as well as fundus imaging.

Visual acuity in all cases was hand motion. Ocular examination revealed normal anterior segment and intra ocular pressure. All cases underwent fundoscopy, fluorescence angiography, B-scan ultrasonography, and ocular coherent tomography (OCT). The patients were followed up for three years between (2007-2010).

Case1- A 20-years old patient: fundus examination showed optic disc hyperemia

and exudative retinal detachment (Figure 1A), fluorescence angiography showed punctuate pin point hyperfluorescence, dye pooling in the fovea and inferiorly (Figure 1B), O.C.T showed hypo-reflective between neurosensore retina and retinal pigment epithelium indicating the presence of serous fluid (Figure 1C), and ultrasonography showed serous retinal detachment located at the posterior pole and inferiorly, diffuse, low to medium reflective choroidal thickening, (Figure 1D).



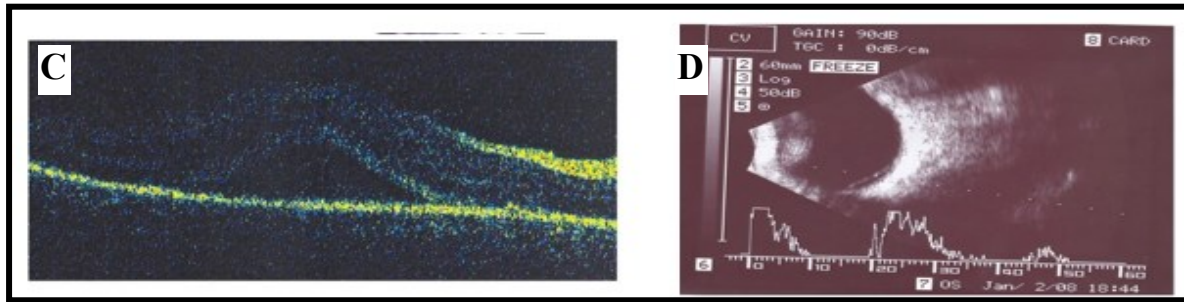


Figure 1: Initial examination of the left eye in case one (A) Color fundus images, (B) Fluorescence angiography, (C) O.C.T, and (D) ultrasonography.

Case 2- A 35-years old patient, (Figure 2). (A) Color fundus images of the left eye showed optic disc edema and exudative retinal detachment in the posterior pole. (B) Fluorescence angiography showed hyperfluorescence and late leakage at the disc, punctate pinpoint hyperfluorescence, dye pooling in the

fovea. (C) O.C.T showed hypo-reflective between neurosensore retina and retinal pigment epithelium indicating the presence of serous fluid. (D) Ultrasonography showed serous retinal detachment located at the posterior pole and inferiorly, diffuse, low to medium reflective choroidal thickening.

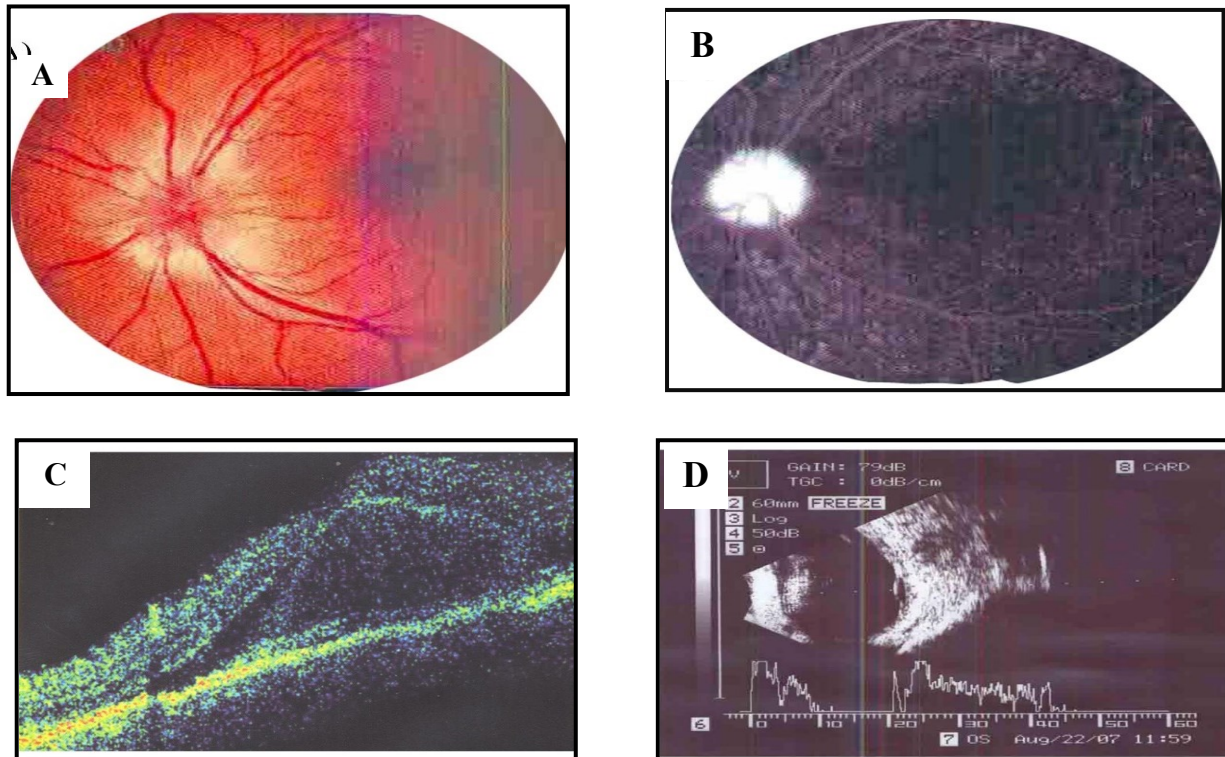


Figure 2: Initial examination of the left eye in case two (A) Color fundus images, (B) Fluorescence angiography, (C) O.C.T, and (D) ultrasonography

Case 3- A 50 years old patient, (Figure 3). (A) Color fundus images of the right eye showed optic disc edema and multiple pockets exudative retinal detachment in the posterior pole and in the periphery. (B) Fluorescence angiography showed hyperfluorescence and late leakage at the disc, punctate pinpoint hyperfluorescence, dye pooling in the

fovea. (C) O.C.T showed hypo-reflective between neurosensore retina and retinal pigment epithelium indicating multiple serous detachments. (D) Ultrasonography showed serous retinal detachment located at the posterior pole and inferiorly, diffuse, low to medium reflective choroidal thickening.

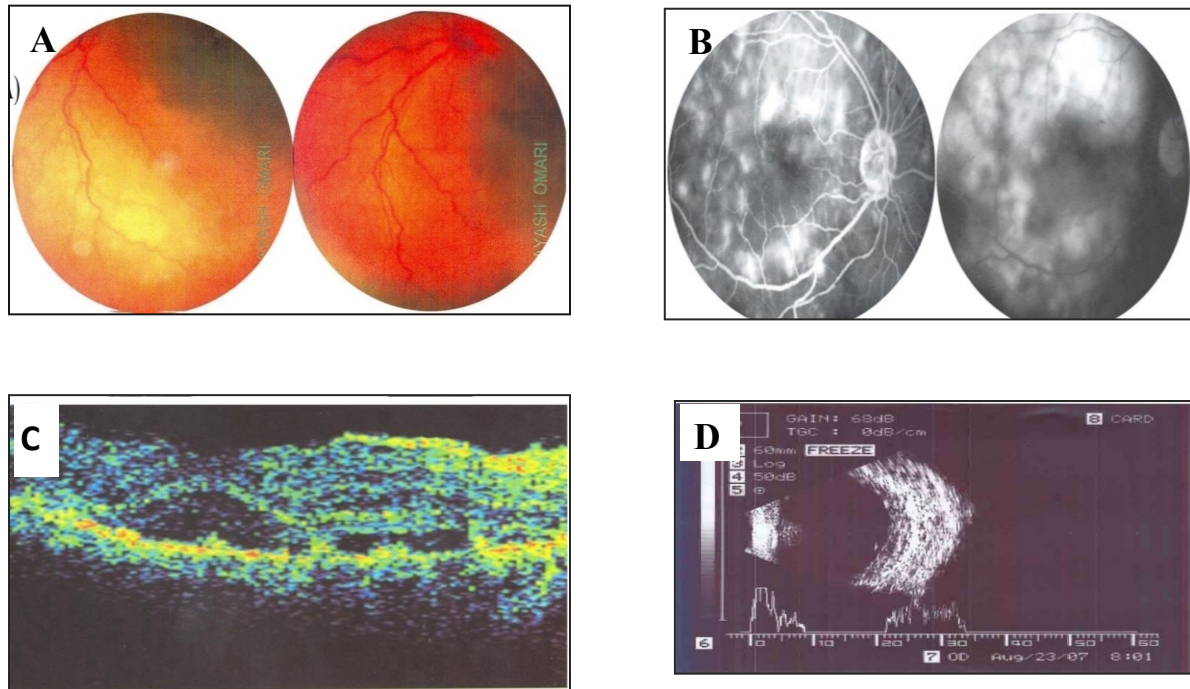


Figure 3: Initial examination of the right eye in case three (A) Color fundus images, (B) Fluorescence angiography, (C) O.C.T, and (D) ultrasonography

All cases were treated by pulse steroid therapy with intravenous Methylprednisolone 1G daily for three consecutive days followed by oral steroid (1mg per kg) with long term tapering.

Results

Table (1) and Figures (4-6) show that after steroid therapy, best corrected visual acuity was improved, and resolution of the serous detachment was detected by color fundus

and OCT. Convalescent phase showed retinal pigment epithelium (RPE) changes in all cases. Figure 4 shows color fundus image of the left eye and OCT shows RPE depigmentation (sunset glow) in case1, Figure 5 shows color fundus images of the left eye and OCT shows RPE scare in case 2, and Figure 6 shows color fundus images of the left eye and OCT shows atrophy, subretinal submacular fibrosis in case 3.

Table 1. Best corrected visual acuity

Cases	Eye	Vision
Case 1	OS	20/40
Case 2	OS	20/22
Case 3	OD	20/160

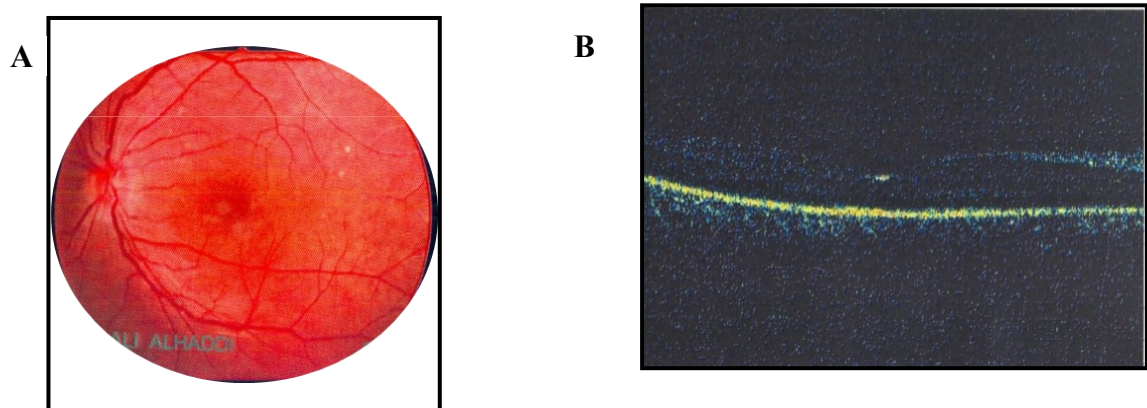


Figure 4: (A) Color fundus images after treatment, and (B) O.C T RPE depigmentation after treatment

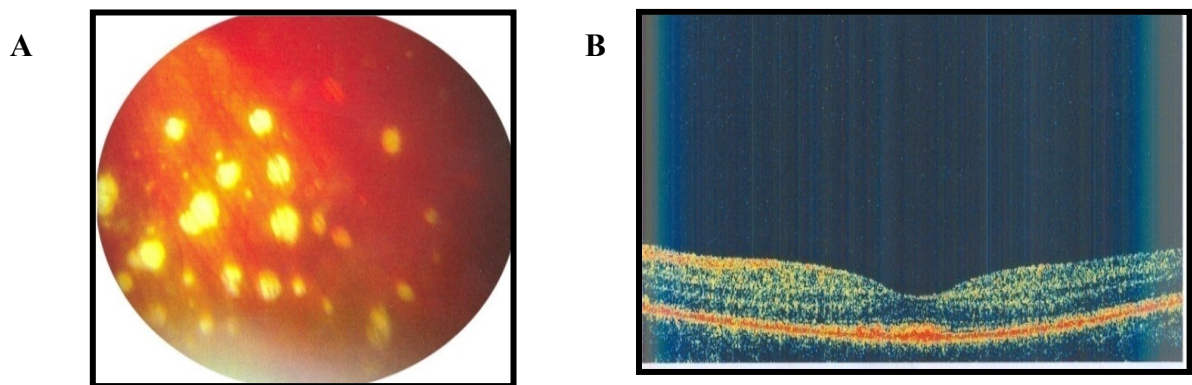


Figure 4: (A) Color fundus images after treatment, and (B) O.C T RPE scare after treatment

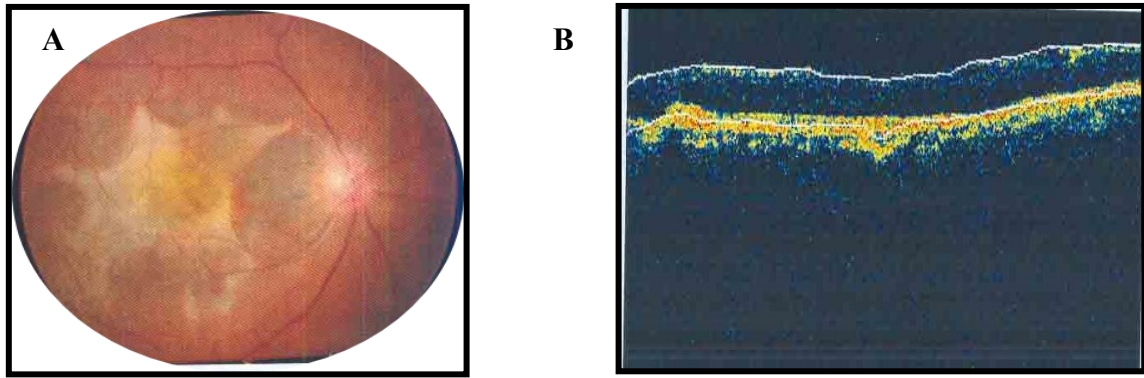


Figure 4: (A) Color fundus images after treatment, and (B) O.C T RPE atrophy, supretinal, supmacular fibrosis after treatment

Discussion

VKHS, a multisystemic inflammatory condition, needs prompt initial treatment to minimize secondary complications and vision loss (16). The treatment of VKH most commonly contains corticosteroids in the acute phase of the disease. When corticosteroids alone are not enough to control a condition or when a patient's response to corticosteroids is insufficient, immunomodulatory therapy may be started. Pulse intravenous corticosteroids, consisting of methylprednisolone 1000 mg/day for 3 days, have been routinely utilized (12). According to our research, intravenous methylprednisolone therapy may cause individuals with acute VKH disease to experience a rapid reduction in inflammation followed by a rapid improvement in visual. This is consistent with a few smaller case studies that show early recovery of visual acuity and quick reduction of subretinal fluid (12, 17-19).

Conclusion

The aim of this study was to investigate the effect of pulse steroid therapy on visual acuity and fundus picture in 3 cases of VKHS in Yemen. VKHS is a rare disease and more common in females worldwide. This is the first study in Yemen. The cases were treated with pulse steroid therapy. The results of this study show that pulse steroid therapy led to rapid resolution of inflammation and subsequently induce rapid recovery of visual acuity in patients with VKHS on the visual acuity and fundus picture of cases. This study suggests that pulse steroid should be used as first line for treatment of VKHS. The most important practical implications are early diagnosis and proper treatment to decrease the complication and to improve the visual acuity.

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Efficacy of Oral Isotretinoin in Combination with Desloratadine in the Treatment of Acne Vulgaris at Al-Thawrah General Hospital, Sana'a, Yemen

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Abstract

Background: Acne vulgaris is one of the most common skin problems in adult life, especially in adolescents.

Objective: This study aimed to evaluate the efficacy of oral isotretinoin in combination with desloratadine in the treatment of acne vulgaris at Al-Thawra General Hospital, Sana'a.

Methods: The study was designed as a prospective comparative clinical trial carried out in the Department of Dermatology, Al-Thawrah General Hospital, Sana'a during the period from Jan. to June 2019. The data were collected from each patient after verbal consent. All patients (60 pt.) were randomized into 2 equal groups (study group and control group). The mean age of the study group was 27.47 ± 4.249 year while 24.07 ± 3.393 year of the control group. Both groups were treated with isotretinoin 20mg per day for 16 weeks. The study group (combined treatment) received 5mg desloratadine daily in 16 weeks. The follow-up was carried in weeks (2, 4, 8, 12, 16) for acne lesion, GAGS score, side effects of drugs and outbreak of acne.

Results: This study found that females were more affected than males and acne lesion at 16 weeks was 16.7 % in the study group in contrast to 40.0 % in the control group. After 16 weeks of treatment, GAGS score showed that both groups had good outputs response to therapy with 86.7% excellent and 13.3% good in the study group compared to 56.7%, excellent, and 40 % good response to therapy. Whereas at 16 weeks most patients had no outbreak (86.7 % in the study group and 53.3 % in the control group), 3% in the study group and 46.7 % in the control group had mild outbreak with > 5 nodules. This study observed only minor side effects of desloratadine among the study group, such as headache and self-limited infection. Side effects of isotretinoin declined more rapidly when desloratadine was

added. In contrast, this study showed that 10 % of patients had chelitis, conjunctivitis and 13.3 % of them had priorities at 16 weeks.

Conclusion: This study showed that adding oral desloratadine to the oral isotretinoin provides a better outcome and advantage in terms of efficacy and tolerability than isotretinoin treatment alone.

Key words: Acne vulgaris, Acne lesion, GAGS score.

Introduction

Acne vulgaris, simply known as acne, is a human skin disease characterized by skin with scaly red skin (seborrhea), blackheads and whiteheads (comedones), pinheads may be of inflammatory or noninflammatory forms [3]. Due to changes in pilosebaceous units, lesions are caused by androgen stimulation. Acne occurs commonly during adolescence, affecting about 80–90% of teenagers in the Western world and lower rate are reported in rural societies [4–7]. It is usually caused by increase in androgens level like testosterone mainly during puberty in both male and female [8]. It also reduces over time and tends to disappear over the age [9, 10]. The large nodules are called cysts and the severe inflammatory acne are called nodulocystic [11]. Cystic acne occurs on buttocks, groin, armpit area, hair follicles and perspiration ducts. It affects deeper skin tissue than common acne. Acne causes drugs have been developed for the treatment of acne vulgaris. In Yemen, there is a lack of data on the magnitude of the disease, as well as on the effectiveness of the different treatments often prescribed for the patients. This study aims to evaluate the efficacy of oral isotretinoin in combination with desloratadine in the treatment of acne vulgaris at Al-Thawra General Hospital, Sana'a via assessing the common presentation of acne vulgaris, determining the relationship

(papules), large papules (nodules), pimples and scarring [1]. Acne affects skin having dense sebaceous follicles in areas including face, chest and back [2]. It

scarring and psychological effects such as reduced self-esteem and in rare cases depression or suicide [12, 13]. Reports showed the incidence of suicidal tendency in patients with acne is about 7.1% [14]. Acne usually occurs during adolescence [15]. Studies have exposed the burden of affecting their global self-esteem. Between 30%-50% of adolescents experience psychological difficulties associated with their acne, and although the interface is multifaceted it can be associated with developmental issues of body image, socialization, and sexuality. Some patients are severely affected and require more than acne therapy alone. In the last 25 years, numerous topical and systemic

between acne vulgaris and gender, and assessing the side effects of both drugs used in this study.

Materials and Methods

Sixty patients of either sex were randomly assigned and enrolled for the receiving of the study prospective comparative clinical trial. It was carried out in the Department of Dermatology, at Al-Thawra General

Hospital, Sana'a during the period from Jan. to June 2019.

Inclusion Criteria: Patients of either sex presented to dermatology clinics with acne vulgaris.

Exclusion Criteria: Pregnant and lactating women. Drug induced Acne form eruptions. Drug allergy. Children less than 12 years.

Method: A complete dermatological examination to identify the lesion along with general physical examination were carried out according to the pre structured questionnaire. The samples were assigned before the start of treatment. A clinical history with duration and prognosis of lesion in past and family history was elicited.

on the appearance of new nodules at each reexamination as: No outbreak (no new lesion), Mild outbreak (< 5 nodules), Moderate outbreak (5-10 nodules) and Severe outbreak (≥ 10 nodules).

The evaluation of clinical efficacy after 16 weeks of treatment was recorded as:

Excellent: When there is no inflammation and non-inflammation lesions, **Good:** When the lesion is reduced by $\geq 90\%$ of the number of lesions, **Fair:** When the lesion is reduced by $\geq 75-90\%$ of the number of lesions, **Moderate:** When the lesion is reduced by $\geq 50-75\%$ of the number of lesions, and **Poor:** When the lesion is reduced by $< 50\%$ of the number of lesions.

Data analysis: Data analysis was performed with SPSS v.20.0 for Windows. The results are expressed as Mean \pm SD for quantitative data and number and percentage for the categorical data. The categorical data were

Sample size: A convenient sample size was used in the study, as all cases of acne vulgaris of various grades of either sex who presented to dermatology clinics were included. A group of 60 patients was randomized into 2 equal groups: study group and control group. Both groups were treated with isotretinoin 20mg per day for 16 weeks. The study group (combined treatment) received 5mg desloratadine daily for 16 weeks.

Evaluation: The number of acne lesions were counted, (Scoring GAGS (Global Acne Grading System)), and side effects after weeks 2, 4, 8, 12 and 16 of treatment were recorded. Evaluation of acne outbreak during treatment was based

analysed by chi-square test to find any association between the different variables. For all the tests, a p-value of 0.05 or less was considered for statistical significance.

Ethical consideration: The aim of the study was explained to each of the participants. The patients gave verbal informed consent for clinical data. All the collected data were confidential and anonymous.

Results

A total of 60 patients were recorded during the study period. Table (1) shows that the mean age of the study group was 27.47 ± 4.249 year whereas 24.07 ± 3.393 year for the control group. This study found that females were more affected than males; the females accounted

53.3% while males were 46.7% for the study group compared to 63.3 % and 36.7% for the control group respectively, Table 2. and Figure 2 show that acne lesion at 16 weeks was 16.7 % in the study group in contrast to 40.0 % in the control group. At 16 weeks, most patients had no outbreak (86.7 % in the study group and 53.3 % in the control group) while 3%

response to therapy (Table 7). This study observed only minor side effects of desloratadine among the study group, such as headache and self-limited infection

in the study group and 46.7 % in the control group had mild outbreak with > 5 nodules (Table 5). On the other hand, after 16 weeks of treatment, GAGS score showed that both groups had good outputs response to therapy with 86.7% excellent and 13.3% good in the study group compared to 56.7%, excellent, and 40 % good in

(Figure 3 and Tables 6-8). The study group showed that 10 % of the patients had chelitis and conjunctivitis and 13.3 % of them had priorities at 16 weeks, (Table 8).

Table 1: Distribution of both groups according to age

Age (Years)	Study group	Control group	<i>P</i> value
Mean ± SD	27.47 ± 4.249	24.07 ± 3.393	
Minimum	20	18	0.283
Maximum	35	30	

Table 2: Distribution of patients in both groups according to sex

Sex	Study group		Control group		<i>P</i> value
	Freq.	%	Freq.	%	
Female	16	53.3	19	63.3	0.432
Male	14	46.7	11	36.7	
Total	30	100	30	100	

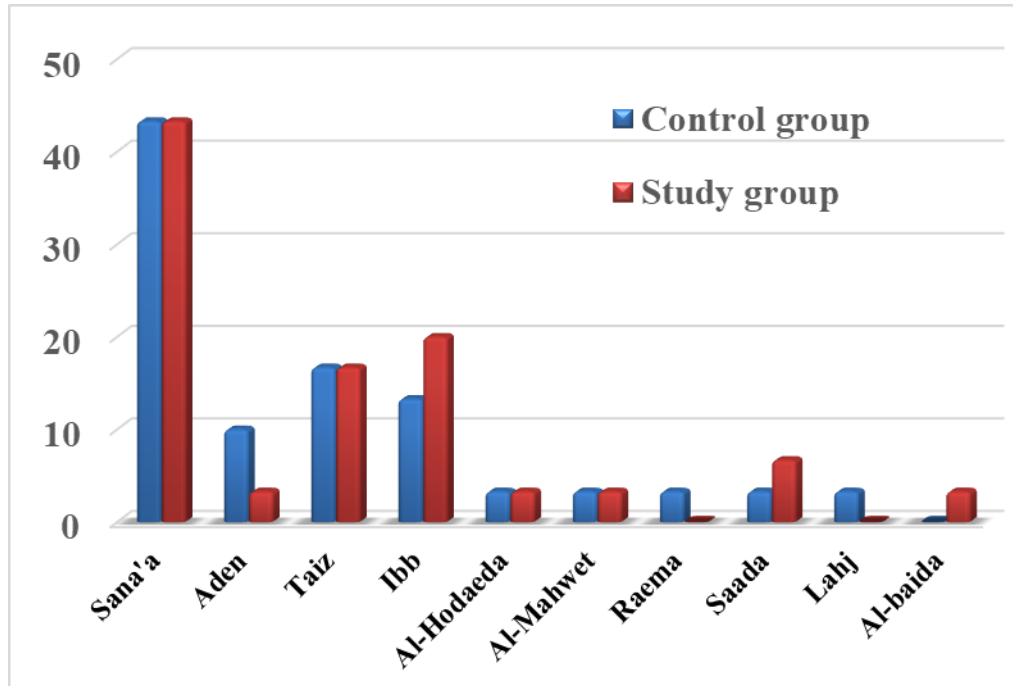


Figure 1: The Characteristics of patients in both groups before treatment in regarding to residence.

Table 3: Duration of acne in both groups

Duration	Study group		Control group		P value
	Freq.	%	Freq.	%	
4-6 months	5	16.7	7	23.3	0.519
>6 months	25	83.3	23	76.7	
Total	30	100	30	100	

Table 4: Severity of acne in both groups

Severity	Study group		Control group		P value
	Freq.	%	Freq.	%	
Mild	1	3.3	0	00.0	0.577
Moderate	17	56.7	18	60.0	
Severe	12	40.0	12	40.0	
Total	30	100.0	30	100.0	

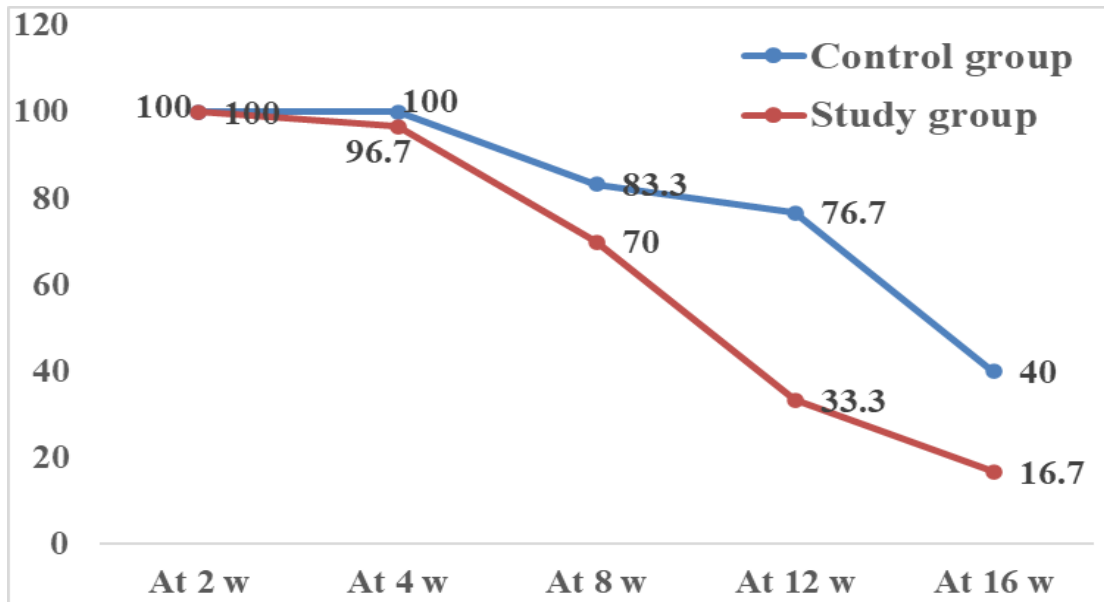


Figure 2: Follow-up of acne lesion of both groups up to 16 weeks

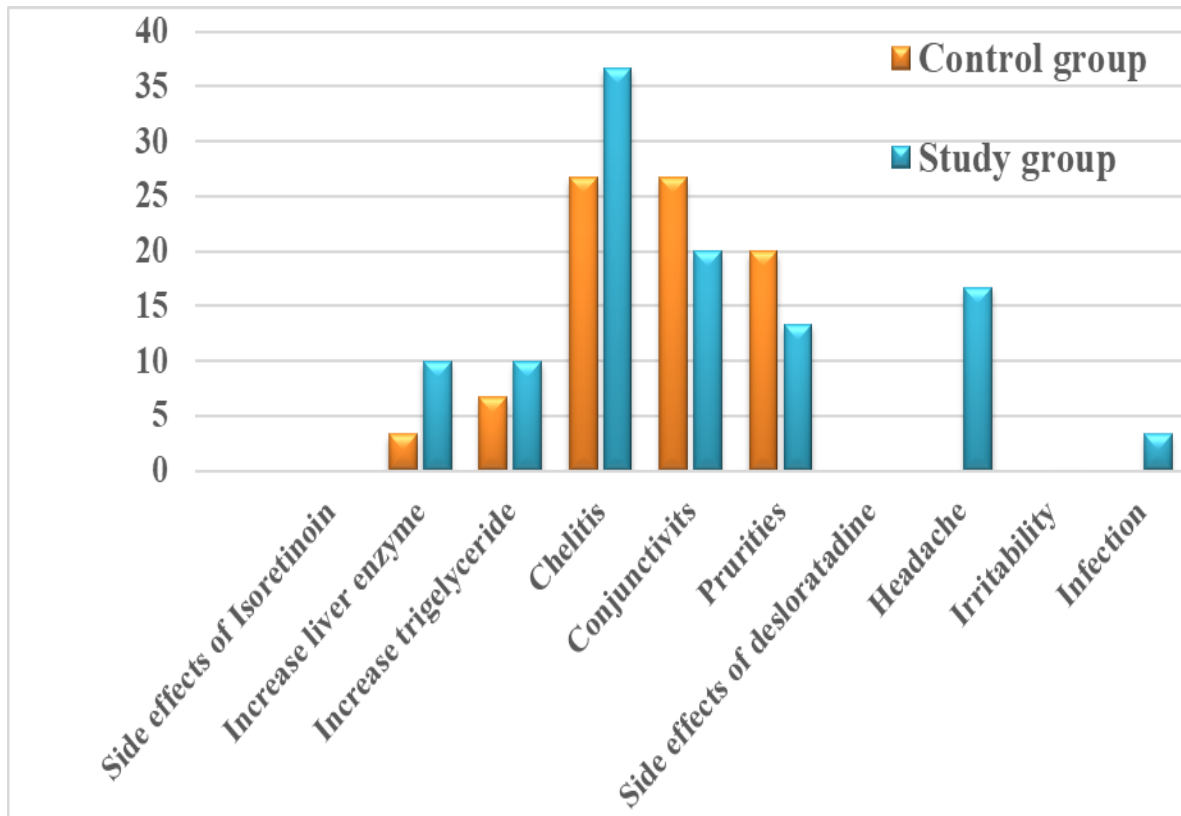


Figure 3: Comparison of side effects of drugs between the two groups at 2 weeks

Table 5: GAGS score during follow-up period

GAGS score	Study group		Control group		P value
	Freq.	%	Freq.	%	
At 2 weeks					
None	0	00.0	0	00.0	0.604
1 – 18	8	26.7	5	16.6	
19 – 30	16	53.3	17	56.7	
31 – 38	6	20.0	8	26.7	
At 4 weeks					
None	1	3.3	0	00.0	0.305
1 – 18	16	53.3	12	40.0	
19 – 30	13	43.3	18	60.0	
31 – 38	0	00.0	0	00.0	
At 8 weeks					
None	9	30.0	5	16.7	0.054
1 – 18	19	63.3	16	53.3	
19 – 30	2	6.7	9	30.0	
31 – 38	0	00.0	0	00.0	
At 12 weeks					
None	19	63.3	6	20.0	0.003
1 – 18	11	36.7	19	63.3	
19- 30	0	00.0	5	16.7	
31 – 38	0	00.0	0	00.0	
At 16 weeks					
None	26	86.7	17	56.7	0.032
1 – 18	4	13.3	12	40.0	
19 – 30	0	00.0	1	3.3	
31 – 38	0	00.0	0	00.0	

Table 6: Comparison of side effects of drugs between the two groups at 8 weeks

Side effect	Study group		Control group		P value
	Freq.	%	Freq.	%	
Side effects of Isoretinoin					
Increase liver enzyme	0	00.0	2	6.7	0.150
Increase triglyceride	1	3.3	4	13.3	0.161
Chelitis	9	30.0	30	100.0	0.000
Conjunctivits	5	16.7	30	100.0	0.000
Prurities	6	20.0	26	86.7	0.000
Side effects of desloratadine					
Headache	5	16.7			
Irritability	0	00.0			
Infection	1	3.3			

Table 7: Comparison of side effects of drugs between the two groups at 12 weeks

Side effect	Study group		Control group		P value
	Freq.	%	Freq.	%	
Side effects of Isoretinoin					
Increase liver enzyme	0	00.0	5	16.7	0.020
Increase triglyceride	1	3.3	9	30.0	0.006
Chelitis	6	20.0	30	100.0	0.000
Conjunctivits	5	16.7	28	93.3	0.000
Prurities	6	20.0	25	83.3	0.000
Side effects of desloratadine					
Headache	5	16.7			
Irritability	0	00.0			
Infection	1	3.3			

Table 8: Comparison of side effects of drugs between the two groups at 16 weeks

Side effect	Study group		Control group		P value
	Freq.	%	Freq.	%	
Side effects of Isoretinoin					
Increase liver enzyme	0	00.0	3	10.0	0.076
Increase triglyceride	0	00.0	14	46.7	0.000
Chelitis	3	10.0	29	96.7	0.000
Conjunctivits	3	10.0	27	90.0	0.000
Prurities	4	13.3	23	76.7	0.000
Side effects of desloratadine					
Headache	3	10.0			
Irritability	0	00.0			
Infection	0	00.0			

Discussion

Out of the 60 patients involved in this study, the mean age of the study group was 27.47 ± 4.249 year while the mean age of the control group was 24.07 ± 3.393 year. There was no significant difference between the two groups ($p = 0.283$). In a study by Van et al. [16] to evaluate the efficacy of oral isotretinoin used alone, and in combination with desloratadine in the treatment of moderate acne vulgaris, the mean age of the study group was 21.90 ± 4.1 years compared to the control group 22.06 ± 4.20 years. Acne vulgaris is the most common skin disease in the United States, affecting almost 85% of people ages 12-25 years old [17]. Cohen et al. [18] observed the prevalence in teenagers aged 15-17 years to be 85%. Acne occurs commonly during adolescence, affecting

about 80–90% of teenagers in the Western world and lower rate are reported in rural societies [19–22].

In another study by Thiobutot and Strauss [19], a greater number of patients were found to have acne during the middle to late teenage period. Burton et al. reported the peak age of acne as between 14-17 years in females and 16-19 years in males. This study found that the females accounted for 53.3% while the male were 46.7% for the study group compared to 63.3% and 36.7% for the control group respectively.

There was no significant difference between the two groups ($p = 0.43$). Van et al [16] in their study which was carried out among 62 patients distributed between 20 female patients and 11 male patients in the study group compared to 19 females and 12

males in the control group observed no statistically significant difference between the two groups ($p = 0.07$). It is reported that acne is more common in females 9.8% compared to males 9.0% (31). In over 40 years old subjects, about 1% of males and 5% of females have problems.

According to Dogra et al [20], acne is more common in females than in males in the ratio 3:1. Similar to Dogra et al [20], the present study showed that females were more affected than males.

In the present study, 2 (6.7%) patients of the study group had lesions on the face alone, 28 (93.3%) had lesions on face, upper chest, and back. Among the control group 20% of the patients had lesions on the face alone, 80% had lesions on face, upper chest, and back. It is reported that 95% of changes are localized on the face and on the upper part of the trunk, rarely on other body parts [23].

The present study is almost in concurrence with the above study in which face was the most common site involved followed by chest, and back. The low rate of involving the face alone among the study group in this study could be due to the severity of lesions that involved all predilection sites. This may be because acne lesions generally occur in sebaceous gland connected with vellus hair [24] and due to regional differences in the activity of type 1, 5-alpha reductase in isolated sebaceous glands.

Out of the 60 patients, 60% of the study group had blackheads lesion (open comedones), grade I, while whiteheads (closed comedones), grade II, was present among (70%). Pustules, grade III, was the most prevalent one (96.7%), redness and inflammation was present in 46.7% and

cysts (40%) taking into consideration that more than one lesion were present in one patient. Among the control group, these lesions were present as 46.7%, 63.3%, 90.0%, 43.3%, and 36.7% respectively. Our results are comparable to the study by Dhaher SA [28]. According to Cohen et al [18], acne vulgaris is a dynamic disorder characterized by the presence of comedones and usually but not always by papules, pustules, nodules, and scars. Comedones are the primary lesions of acne, the inflammatory lesions vary from small papules to pustules to large tender fluctuant nodules. True cysts are rarely found in acne.

The main goal of acne treatment is to control and treat existing acne lesions, prevent permanent scarring as far as possible, limit the duration of the disorder and to minimize morbidity. The patient should be informed on the aims involved in preventing new acne lesions while allowing the existing ones to heal. Patients should also be made aware that it may take 3–6 weeks until an improvement can be observed [25,26].

In this study, an attempt was made to evaluate if there is any beneficial effect from adding oral antihistamine (desloratadine 5 mg/day) as adjuvant therapy to the isotretinoin in a randomized clinical trial for the treatment of acne.

It is observed in this study that the GAGS score in the study group during the first two weeks of follow-up was similar to the control group with no significant differences among all weeks of follow-up ($p = 0.60$). However, in weeks 12 and 16 there was gradual reduction of scoring indicating moderate response to the

treatment. After 16 weeks of treatment, both groups had good outputs: the study group achieved 86.7% excellent, 13.3 % good, while the results in the control group were 56.7%, excellent, and 40 % good response to therapy. In Lee's study, the study group had 40% of cases clear, 50% improvement while the control group had 20% of patients clear, and 40% improvement [27].

Success in treating acne depends on several factors including an accurate diagnosis, appropriate treatment, and most importantly patient adherence. The pathogenesis of acne is generally well-understood and is easy to diagnose. The present study showed that 70% of the patients had moderate outbreak of lesion (5-10 nodules) among the study group at week 2 compared to 50% of the control group with significant difference between the two groups ($p = 0.005$). At week 4, there was a mild outbreak (> 5 nodules) among 66.7% of the study group compared to 40 % of the control group. At week 8, the study group showed only 36.7% of patients had mild outbreak compared to 46.7% of the control group. There was a significant improvement of the study group regarding the outbreak as 80% of patients had no outbreak compared to 40% of the control group. At week 16, only 13% of the study group had mild outbreak compared to 46.7% of the control group. It is reported that acne outbreaks are common side effects after starting treatment with isotretinoin for 2-4 weeks. The mechanism of the outbreak is unclear, but it is related to the release of *P. acnes* and sebaceous gland antigens, enhancing the inflammatory response. However, we

found in this study that there was a lower outbreak with time.

This study revealed that isotretinoin side effects were statistically significant among the study group compared to the control group in terms of increase of liver enzymes, increased triglyceride, and chelitis, while the pruritus and conjunctivitis showed lower rate than in the control group. This might be related to the anti-inflammatory effect of antihistamines which reduces the side effects of itching and acne outbreaks as another study reported [16].

Isotretinoin is the only therapy that targets all the primary causal factors involved in acne [28]. Oral isotretinoin, unlike antibiotics, does not act directly on microbial cells [28]. It markedly reduces the sebum excretion rate and the sebaceous gland size [29]. By reducing sebum secretion, the drug consequently decreases the follicular hyperkeratinisation and alters the microenvironment within the duct, providing greater *Propionibacterium acnes* (*P. acnes*) suppression than that seen with topical or oral antibiotics [30].

Regarding the side effects of desloratadine, this study observed only minor side effects among the study group, as headache (16.7%) and self-limited infection (3.3%). It is reported that antihistamines had a sebum regulating effect, notably, they reduce squalene release, a biomarker of sebum, [31] from sebaceous glands by blocking the overexpressed histamine receptors in sebocytes, resulting in low squalene level and this phenomenal effect will not be influenced by concomitant isotretinoin therapy because retinoids were

lacking the squalene reducing property [32].

Conclusion

This study demonstrated that adding oral desloratadine to the oral isotretinoin provides a better outcome and advantage in terms of efficacy and tolerability than isotretinoin treatment alone. Severity of acne should not only be assessed exclusively on the physical grade of acne alone, but also should include its psychological and state of mind of teenagers.

Education of dermatologists and general practitioners alike, about the psychosocial impairments of acne can help in identifying cases with acne related depression.

There is a need for incorporation of psychological intervention in the management of acne vulgaris, for improvement in the quality of life and psychological wellbeing in such cases.

The impairment of quality of life can be alleviated by appropriate acne treatment along with psychosocial support. Setting up supportive groups could also be of immense help for these patients. Family involvement can also help the patient to come out of any such distress. A proper guidance and help are rights of every individual.

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Prevalence of Hematuria among School Children in Shueub and Bani al-Harith in Sana'a city, Yemen

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Abstract

Objective: Screening of kidney diseases by urinalysis in school children has been approved in many parts of the world with inexpensive tools such as urinary dipsticks. In this study, we investigated the prevalence of hematuria in a large sample of 6 to 15-year-old Yemeni school students in Shueub (located in the northeast of Sana'a city) and Bani al-Harith (located in the north of Sana'a city).

Design: A total population of 12,347 Yemeni students in primary and middle schools in Shueub and Bani al-Harith were investigated for hematuria during 2021. There were 7,299 students from Shueub and the remaining 5,048 were from Bani al-Harith, aged from 6 to 15 years old. All the examined children were apparently healthy and asymptomatic. Parents' consents were taken prior to the test. A random fresh mid-stream urine was collected to complete the urine analysis (by dipstick and microscopy) to detect microscopic hematuria, albuminuria, or pus cells for each student.

Results: Among the 12,347 students screened and urine samples provided, 2,745 (22.23%) of the total population had hematuria, 1,822 (14.76%) from Shueub and 923 (7.48%) from Bani al-Harith. Analysis of the prevalence of hematuria in students in Shueub and Bani al-Harith showed that there was a very highly significant difference between the two areas (P value = 0.0000). There were 842 students (7% of the total population) had positive hematuria and 2,678 students (22%) had negative hematuria with a highly statistically significant difference between positive hematuria students and negative hematuria students (P value = 0.0044).

Conclusion: Asymptomatic hematuria might be detected by the school screening program and should be considered as an inexpensive way for early management of some renal diseases.

Keywords: Hematuria, dipstick, urinalysis, proteinuria, glucosuria

Introduction

The detection of even microscopic amounts of blood in a child's urine alarms the patient, parents, and physician, and often prompts the performance of many laboratory studies. Hematuria is one of the most important signs of renal or bladder disease, but proteinuria is a more important diagnostic and prognostic finding, except in the case of calculi or malignancies. Hematuria is almost never a cause of anemia. The physician should ensure that serious conditions are not overlooked, avoid unnecessary and often expensive laboratory studies, reassure the family, and provide guidelines for additional studies if there is a change in the child's course [1]. This article provides an approach to the evaluation and management of hematuria in a child [2,3]. Many tests have been recommended for the child with hematuria, but no consensus exists on a stepwise evaluation. Although more research is needed to resolve certain controversies in management, the suggested approach aims to detect major or treatable problems and limit the anxiety, cost, and energy required by unnecessary testing.

Hematuria is the most frequently caused by urinary tract infections (UTIs). A UTI is an infection anywhere in the urinary tract, which is made up of the bladder, ureters, and kidneys. Cystitis refers to an infection of the bladder, while pyelonephritis refers to an infection of the kidney [3]. One of the most typical causes of persistent microscopic hematuria is hypercalciuria [2]. Hypercalciuria known in children more than 2 years of age as a urine calcium/creatinine ratio more than 0.2 (mg/mg), has been

linked to ongoing asymptomatic microscopic hematuria [1]. Screening of kidney diseases has been of interest to many investigators for the last three decades. For example, Japan [4] and the USA [5] used urinalysis for screening in children and adolescents primarily with the commonly used dip and read test strips (dipsticks), mainly to detect hematuria. Several studies have demonstrated that urinalysis is the simplest and least expensive method for screening healthy children. Mass screening has been performed in Japan for the early diagnosis of chronic renal diseases since 1973 [4,6].

Hematuria is usually seen in the primary period of systemic diseases and kidney diseases, such as acute glomerulonephritis and UTI [5]. Early detection of these findings and diagnosis of the disease may facilitate preventing, halting, and deferring the progression of some diseases. The aim of the current study was to screen the prevalence of hematuria and urine abnormalities among 12,347 school students in Shueub and Bani al-Harith, Yemen.

Incidence and prevalence

Pediatricians frequently encounter hematuria in children. Macroscopic hematuria has an estimated incidence of 1.3 per 1000 [2]. Microscopic hematuria, although more common than gross hematuria, has a variably reported incidence depending on the definition used for making the diagnosis. The incidence of microscopic hematuria in schoolchildren was estimated at 0.41% when four urine samples per child were collected and 0.32% in girls and 0.14% in

boys when five consecutive urine specimens were analyzed over 5 years [10,11]. Microscopic hematuria in two or more urine samples are found in 1% to 2% of children 6 to 15 years of age.

Study Objectives

To assess the prevalence of hematuria in Yemeni school students aged from 6 to 15 years old in Shueub and Bani al-Harith.

Study Settings

The study was conducted in Sana'a, the capital of Yemen, in schools of Shueub and Bani al-Harith among students aged between 6 - 15 years.

Study period: The study was conducted between October 2021 and December 2021.

Literature Review

To the best of knowledge of the researchers, no previous study has been conducted on this subject in Yemen. On the other hand, a cross-sectional study was conducted in 8 intermediate public schools in Jeddah, Saudi Arabia between (March 2015 and June 2015). The study included healthy kids, ages 11 to 18, in the population. Children with known renal conditions, hypertension, or other concomitant conditions were not included in the study. There were 401 children in the overall sample (201 girls and 200 boys). In Jeddah, one public school was chosen at random from each area (for both genders). This study included 401 children (200 males) with a mean (SD) age of 13.87 (1.27). 17.2% of the participants had hypertension, and the male to female ratio was 1.4:1. 4.2% of the participants had pre-hypertension, with a male to female ratio of 2.1:1. A male was found to be obese in 19.2% of cases. It was shown that there is a

positive correlation between adolescent hypertension and the prevalence of obesity. Additionally substantial levels of hematuria and proteinuria were detected. Thus, screening, and preventative measures were advised [13].

A descriptive study was conducted for 661 public school children in Healthy School Children in Pakistan (2013). The study aimed to ascertain the prevalence of high blood pressure (BP), its correlation with a high body mass index (BMI), asymptomatic hematuria, and Proteinuria in healthy school-aged Pakistani children, by measuring their body weight, height, blood pressure, and performed a single urine dipstick test for hematuria. This study showed a prevalence of Asymptomatic proteinuria and hematuria were detected in 31 (4.7%) and eight (1.2%) children, respectively. The independent risk factors for hypertension and pre-hypertension were age of the child (RR 1.2 95% CI 1–1.4), gender (RR 2.0 for being female 95% CI 1–4.4), BMI >25 (RR for BMI 25–30 = 2.6 and RR for BMI>30 = 4.3), positive urine dipstick for proteinuria (RR = 2.3, 95% CI 0.7–7.7) and positive urine dipstick for hematuria (RR 1.0, 95% CI 0.2–8.3). The study concluded that community-based screening programs for children should target high-risk populations for early identification and lifestyle changes and should include blood pressure monitoring, BMI measurement, and urine dipstick analysis [17]

Methodology

This is a cross sectional descriptive prospective study where 12,347 Yemeni school students were randomly recruited

from 44 schools in Shueub and 40 schools in Bani al-Harith. The sample consisted of 7,299 students (59.1%) from Shueub while the remaining 5,048 students (40.8%) were from Bani al-Harith, aged from 6 to 15 years old.

All the selected students were given a questionnaire to be filled out by their parents, regarding the child's age, gender, and health conditions. Measurements were taken by trained volunteers in a consistent and standardized manner. The patients were categorized according to the presence of hematuria in urinary sediment into three groups as (Normal, Abnormal, Controversial) and sorted according to their gender and geographic distribution. Abnormal means that there are 5 or more RBCs per high power field in the urine, in the other hand the controversial are the results which are in doubt when there are 4 to 6 RBCs per high power field in the urine. The clinical manifestation was classified dependently according to the presence or absence of hematuria in urinalysis. After collecting the results from urine analysis tests, the SPSS program was used to analyze the data.

Urine specimens were obtained from each student, tested with urine dipsticks for hematuria, proteinuria and glucosuria. If positive results were confirmed, a microscope was used to examine a urine sample. The ages of the participant students were from 6-15 years, both sexes were represented, and all were asymptomatic and healthy at inclusion. The children who had any of the following disorders were excluded: non-orthostatic proteinuria, previous urolithiasis, documented urinary tract infection (UTI), acute or chronic

glomerulopathies, sickle cell disease, known bleeding diathesis and chronic systemic illness.

Study Sampling

A stratified random sampling system was followed, adopting the systematic approach.

Statistical Methodology

Numbers and percentages for all the measurements were calculated and demonstrated in frequency tables. Comparability tests were measured among students of the two areas of the study using chi-square test for categorical variables, such as gender type, and t-test for continuous variables, such as age level. Significance was detected at P value < 0.05 .

Ethical Considerations

A written ethical clearance that allows using consent for this study was obtained from the concerned education office. All the study participants were fully informed about the purpose of the study. Consent was obtained from the legal guardian for those respondents who were less than 15 years old. They were informed that the provided information will be kept confidential and used only for research purposes.

Results

Urine analysis

A very highly significant difference was detected between Shueub students and Bani al-Harith students in the prevalence of hematuria (P value = 0.000). Out of the total participants, 1,300 (10.53%) of Shueub boy-students, 522 (4.23%) of Shueub girl-students, 670 (5.43%) of Bani al-Harith boy-students and 253 (2.04%) of Bani al-Harith girl-students had hematuria respectively.

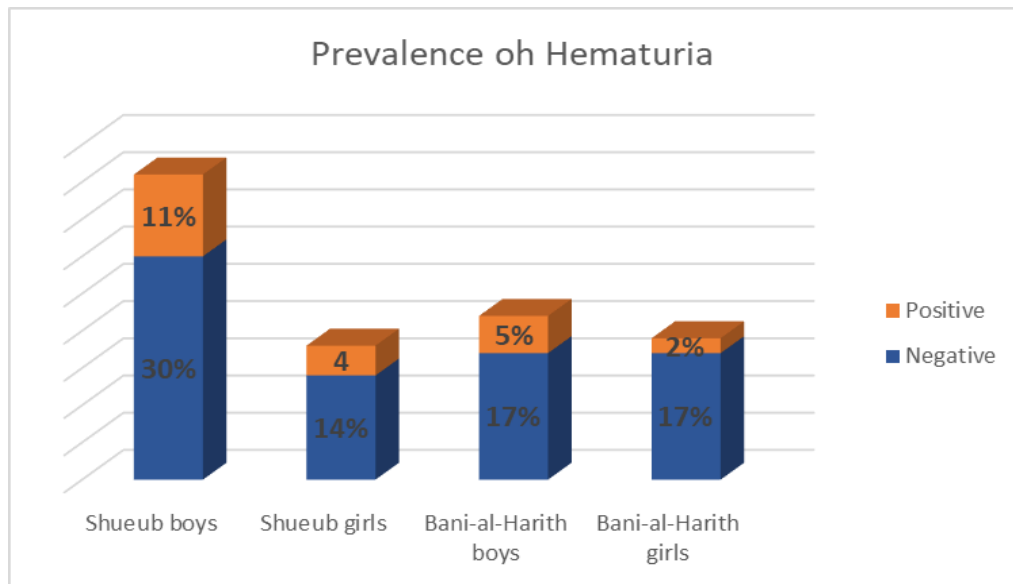


Figure (1): The prevalence of hematuria between students in Shueub and Bani al-Harith

In addition, there was a very high statistically significant difference between Shueub students and Bani al-Harith students in the prevalence of proteinuria (P value = 0.0000), were 4,285 (34.70%) boy-students

and 1,065 (8.63%) girl-students in Shueub had proteinuria, while only 81 (0.66%) boy-students and 37 (0.3%) girl-students in Bani al-Harith had proteinuria.

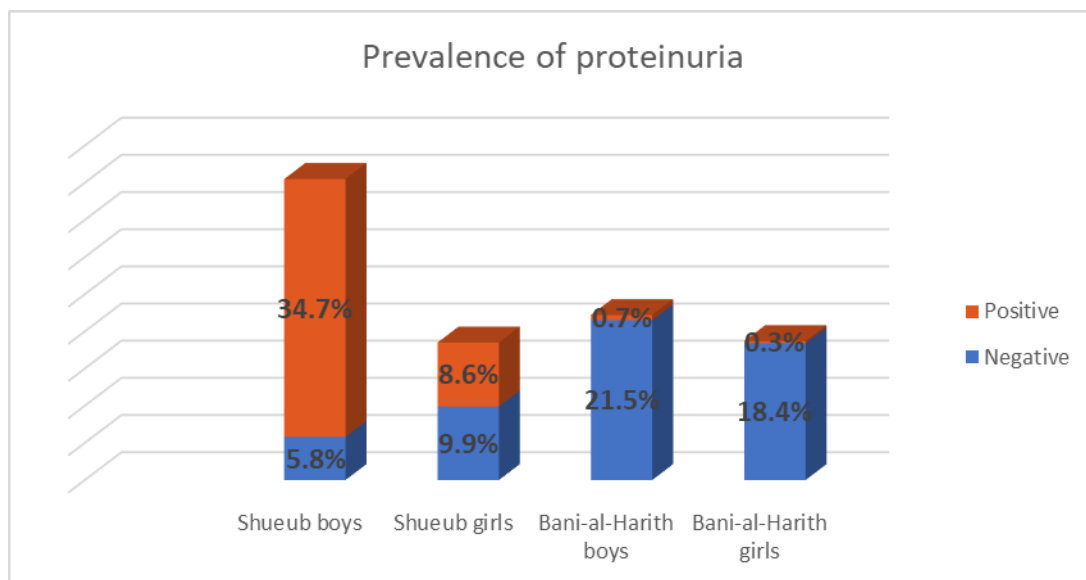


Figure (2): The prevalence of proteinuria between students in Shueub and Bani al-Harith

Regarding glucosuria, there was a very highly significant difference between Shueub and Bani al-Harith students in prevalence (P value = 0.0000), as 36

(0.29%) boy-students and 13 (0.11%) girl-students in Shueub had glucosuria, while only one student had glucosuria in Bani al-Harith.

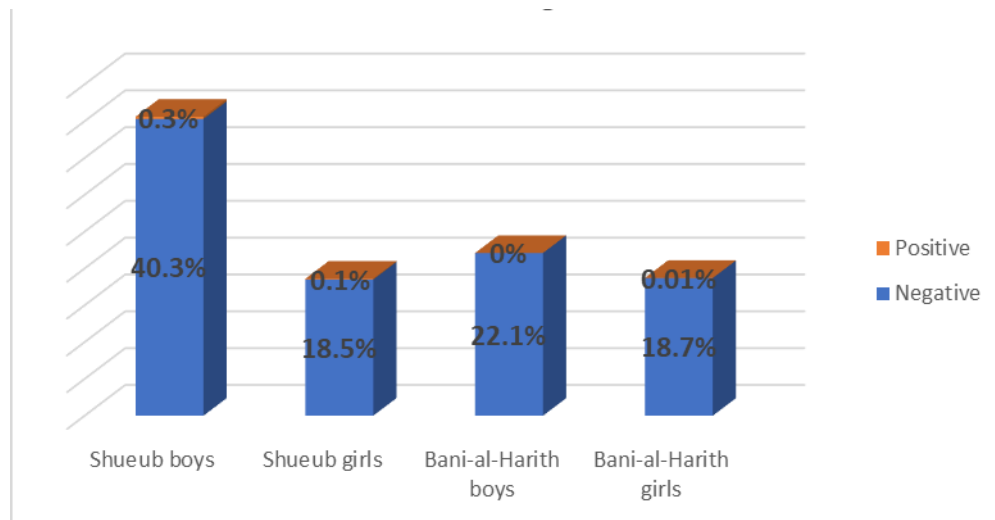


Figure (3): The prevalence of glucosuria between students in Shueub and Bani al-Harith

There was a very highly statistical difference between Shueub students and Bani al-Harith students in specific gravity, PH measurements, leucocyte, nitrite, ketone,

and bilirubin (P value = 0.000). The data also showed a high statistical difference in urobilinogen measurements (P value = 0.005) among the study groups.

Table (1): Detailed urine analysis

		Overall	Shueub		Bani al Harith		P
			Boys	Girls	Boys	Girls	
Specific Gravity	Mean \pm SE	1.02 \pm 0.00	1.02 \pm 0.00	1.02 \pm 0.00	1.02 \pm 0.00	1.02 \pm 0.00	0.000
	Range	0.025 – 1.25	0.025 – 1.25	1 – 1.03	1 – 1.25	1 – 1.03	
PH	Mean \pm SE	5.45 \pm 0.01	5.42 \pm 0.01	5.42 \pm 0.01	5.45 \pm 0.02	5.54 \pm 0.02	0.000
	Range	5 – 10	5 – 9	5 – 9	5 – 10	5 – 9	
Leucocyte	Negative	11373 (92%)	4533 (91%)	1869 (82%)	2722 (99.6%)	2249 (97%)	0.000
	Positive	974 (8%)	474 (9%)	423 (18%)	12 (0.4%)	65 (3%)	
Nitrite	Negative	11978 (97%)	4738 (95%)	2247 (98%)	2715 (99%)	2278 (98%)	0.000
	Positive	369 (3%)	269 (5%)	45 (2%)	19 (1%)	36 (2%)	
Ketone	Negative	11944 (97%)	4693 (94%)	2227 (97%)	2710 (99%)	2314 (100%)	0.000
	Positive	403 (3%)	314 (6%)	65 (3%)	24 (1%)	0 (0%)	
Urobilinogen	Negative	12254 (99%)	4944 (99%)	2287 (99.8%)	2734 (100%)	2289 (99%)	0.005
	Positive	93 (1%)	63 (1%)	5 (0.2%)	0 (0%)	25 (1%)	
Bilirubin	Negative	11456 (93%)	4340 (87%)	2209 (96%)	2635 (96%)	2272 (98%)	0.000
	Positive	891 (7%)	667 (13%)	83 (4%)	99 (4%)	42 (2%)	

Discussion

This study was designed to find out the differences in the prevalence of hematuria among Yemeni school students at Shueub and Bani al-Harith. Hematuria was measured in this study with a urine dipstick and microscopy. Hematuria was also defined as the presence of 5 or more red blood cells (RBCs) per high-power field.

The survey revealed that 1,822 Shueub students (14.75% of the total population) had hematuria versus 923 Bani al-Harith students (7.47% of the total population) with very highly statistically significant difference between them with P value= 0.000. The predisposing factors and the relation of renal stones with the prevalence of hematuria will be discussed in a forthcoming study.

A cross-sectional study was conducted in 8 intermediate public schools in Jeddah, Saudi Arabia

. The study included healthy kids, aged between 11 to 18 years. Children with known renal conditions, hypertension, or other concomitant conditions were not included in the study. There were 401 children in the overall sample (201 girls and 200 boys). In Jeddah, one public school was chosen at random from each area (for both genders). This study included a total of 401 children (200 males) with a mean (SD) age of 13.87 (1.27). 17.2% of sample had hypertension, and the male to female ratio was 1.4:1. 4.2% of the participants had pre-hypertension, with a male to female ratio of 2.1:1. A male was found to be obese in 19.2% of cases. It was shown that there is a positive correlation between adolescent hypertension and the prevalence of obesity.

Additionally substantial levels of hematuria and proteinuria were detected. Thus, screening, and preventative measures are advised.

Murakami M. et al found that the annual incidence of urinary abnormality in elementary school children from 6 to 10 years old was 0.19% for hematuria [4]. Another study showed that the cumulative occurrence of hematuria was high, greater than 6% [12]. The study made by Vehaskari et al screened an unselected population for hematuria; four urine specimens from each were examined and microscopic hematuria was found in one or more specimens in 4.1%, and in two or more specimens in 1.1% of the studied children [7]. Dodge et al conducted urinalyses on 6- to 12-year-old children and found hematuria in 0.34% of females and 0.12% of male [14].

The study carried out by Park identified a total of 1,044 school children with hematuria and/or proteinuria during a mass school urine screening test and they were referred to pediatric nephrologists at 13 hospitals in Korea. These children had isolated hematuria (IH) (60.1%), isolated proteinuria (IP) or combined hematuria and proteinuria (CHP) (13.5%). This study showed that the use of a mass school urine screening program can detect chronic renal disease in its early stage [4].

Although Kaplan and colleagues stated that multiple screening dipstick urinalyses in asymptomatic pediatric patients are costly and should be discontinued, they proposed a single screening dipstick urinalysis to be obtained at school entry age, between 5 and 6 years, in all asymptomatic children [8].

Kawasaki et al found that early identification by yearly school urinary

screening may enable early management and improve prognosis for renal diseases in children [11].

Although our study revealed a higher prevalence rate, unlike the above-mentioned statistics, the detected abnormalities in the present study can be used to indicate its impact. Screening tests, such as blood pressure, growth and development, and general physical examination are being conducted in all preschool children. If dipstick urinalysis with its inexpensive costs could be added to our country screening program, it could contribute to the detection of the affected children in their early stages of renal diseases, resulting in the survival of kidneys at risk.

Limitations of the Study

Delayed authorizations from the education office to conduct this research, taking approximately a period of one month.

Most of people are illiterate or do not understand the objectives of our research, which resulted in the difficulty of getting approval to take urine samples or providing stool samples instead of urine sample, and this requires more explanation and much time to clarify the objectives and purpose of the current research.

Conclusion

The findings pertaining to prevalence of hematuria in Yemeni school students in Shueub and Bani al-Harith showed higher rates rather higher than found in other related studies. It was also found that it would be possible to screen a large population of children at a relatively low cost, providing the framework for further actions that may lead to the prevention and timely diagnosis of renal diseases.

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Patient Safety Culture among Physicians at Public Hospitals in Sana'a, Yemen: A Retrospective Cross-Sectional Study

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Abstract

Background: Patient safety is a critical component to the quality of health care, represents a global public health problem which affects countries at all levels of development. Healthcare organizations endeavour to improve their quality of care. Aims of study were to explore the patient safety culture among physicians according to AHRQ (Agency of Health Research and Quality) dimensions, to determine grade of patient safety at public hospitals, and to determine the rate of event reports.

Methods: A retrospective cross-sectional study, using hospital survey on patient safety culture to measure the 12 dimensions of the patient safety culture at public hospitals in Sana'a, Yemen. SPSS 20. was used for statistical analysis, descriptive analysis, and ANOVA f-test.

Results: Out of 384 physicians, positive response rate was (66%), revealing acceptable level of patient safety. The highest positive response rate was team-work within units (69.1%) while the lowest positive responses was nonpunitive response to errors (29.8%). Majority of respondents did not record any event report during the past 12 months. The results showed that hospital physicians had weak perception toward patient safety culture.

Conclusion: Patient safety is a low priority at public hospitals, there is a tendency for under-reporting of errors. To create a culture of safety and improvement, fear of blame must eliminate, and to create a climate of open communication, continuous learning and focus on leadership should be considered.

Keywords: patient safety culture, public hospitals, Sana'a Yemen.

Introduction

Patient safety represents a global public health problem which affects countries at all levels of development. World Alliance for Patient Safety was established in 2004 to mobilize global efforts to improve the patient safety of healthcare members. It becomes a major priority to policy makers, healthcare providers and managers [1]. International accreditation organizations require patient safety culture assessments, it is the first step for developing a strong patient safety culture. To evaluate the perception of healthcare staff on issues such as team work, actions must be taken by management and leadership to support and promote patient safety, frequency of incident reporting, and other patient safety culture [2].

History of patient safety is not limited to the current time, it has been known since thousands of years; practiced by Greeks when the physician Hippocrates swore to protect patient from any harm or damage [3]. In the modern era, the beginning was in the start of the eighties, with full magnitude appreciated in 1999 when the institute of medicine (IOM) of National Academy of Science released a report, To Err is human [4].

Agency of Healthcare Research and Quality (AHRQ) defines patient safety as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery [5, 6]. AHRQ explains the safety culture of an organization as the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to the style

and proficiency of an organization's health and safety management [6]. In 2004, AHRQ designed a Hospital Survey on Patient Safety Culture (HSOPSC) [6, 7], which has a good criteria test [6, 8, 9]. As such, this survey has been selected as a tool to identify the physicians' perception of patient safety culture.

In 1999, the landmark report To Err Is Human reported that up to 98 000 people die because of medical errors each year in the United States [10]. Then, in 2009, Leape suggested that transparency patient-centered care, collaboration, teamwork, and accountability should be shared [11]. After that, many studies were conducted in many countries regarding patient safety culture by using hospital survey on patient safety culture. Organizational learning was the highest positive trait in Saudi Arabia [12]. whereas and non-punitive response to error was the lowest positive one in Egypt [13]. In Palestine, the highest positive score was for team work within units while the lowest score was for non-punitive response to error, rating patient safety level as excellent/very good [14]. The most recognized aspects of patient safety culture in Tehran were team work within units and non-punitive response to error [15]. In Slovak hospitals, the highest score was for overall perception of safety, staff also admitted to being fearful of adverse event reporting [16].

In Yemen, to the best of the researchers' knowledge, there is no enough research studies on medical errors and/or patient safety. Therefore, this research intends to provide a baseline database to this crucial

topic, with special focus on physicians who are the corner stone in providing health care services and are the team leaders. The aims of this study were to explore patient safety culture among physicians according to AHRQ dimensions, to determine the level of patient safety at public hospitals, and to determine the rate of event reports filled out and submitted by physicians in the last year.

The findings are supposed to provide healthcare organizations in Yemen a better understanding of patient safety culture.

Methodology

Study design

A retrospective cross-sectional study was conducted in three public hospitals in Sana'a, Yemen, namely, Al-Thawra General Hospital, Al-Kuwait Educational Hospital and 48 Model Hospital. The study lasted for nine months, from January till September 2014.

Population

The study population involved the physicians working at public hospitals in Sana'a, Yemen.

Sampling

Sample size of the study was calculated by using the formula of Kish Leslie 1965 [$N = Z^2 (P (1-P) / D^2)$]. Based on a previous study in Saudi Arabia, the expected proportion (over all perception of staff was 33%). The initial number of the sample size was 345 physicians. To avoid drop out, 35 physicians (10% of the primary number) were added, making the total sample size

380 physicians. 650 copies of the questioner were distributed, 451 were handed back- 8 of them were not filled up and 58 were excluded for incomplete or illegible responses. The remaining 199 copies were given back. The physicians were selected from all hospital departments, including all level of qualifications.

Data Collection

Questionnaire

Data collection took a period of three months, July–September 2014, by the means of the standardized questionnaire Hospital Survey on Patient Safety Culture (HSOPSC) released by the Agency for Healthcare Research and Quality (AHRQ) in 2004 (Tables 1&2). It contained 42 items to measure 12 dimensions of patient safety culture, each dimension included 3 or 4 items. Survey items were developed in a Likert 5-point-scale by which the responses were categorized in terms of agreement (5=strongly agree; 4=agree; 3=neither; 2=disagree; 1=strongly disagree) and frequency (5=always; 4=most of the time; 3=sometimes; 2=rarely; 1=never). Reverse worded was also included to provide consistency: 6,7, and 8. Approval was obtained from the research ethical committee of the University of Science and Technology. Permission to collect the data was granted by the hospitals administrations, details about the study were explained to the physicians, and oral consent was obtained firstly. To ensure the privacy of the respondents, the

less than an entire section, less than half of the items, or provided similar responses to all items were excluded.

Study Measures and Outcome Variables

The measured 12 dimensions of patient safety culture variable were: (A) Seven unit-level aspects of patient safety culture, including (1) Supervisor/manager expectations and actions promoting safety; (2) Organizational learning-continuous improvement; (3) Teamwork within units; (4) Communication openness; (5) Feedback and communication about error; (6) Nonpunitive response to error; (7) Staffing, (B) Three hospital-level aspects, including (1) Hospital management support for patient safety; (2) Team work across hospital units; (3) Hospital handoffs and transitions, and (C) Two outcomes: (1) Overall perceptions of safety; (2) Frequency of event reporting [6-8], in addition to patient safety grade and number of events reported.

Data analysis

The data was analyzed through two steps using Statistical Package for Social

Sciences (SPSS) version 20.0. These steps were: descriptive analysis (frequency and percentage), and ANOVA f-test (means of each groups of patient safety dimensions, f-test comparison of multiple means at once).

Validity Analysis:

Composite Scores and Intercorrelations

Composite score was created for the 12 dimensions of safety culture by obtaining the mean of the responses to items in each dimension (after any necessary reverse coding). A composite score calculated for each response, in relation to each of the 12 dimensions of safety culture. Since 5-point response scale was used for all items, composite scores ranged from 1.0 to 5.0 (1 = a low score and 5 = a high score). After calculating the composite scores, the safety culture dimensions were correlated with one another.

Reliability was examined across each of the 12 patient safety culture dimensions using Cronbach's alpha test, showing an acceptable reliability ranging from 0.54 to 0.89.

Table 1: Operational definition of dependent variables

No.	Variable Name	Definition	Scale
1	Patient safety culture among physicians,	<p>The 12 dimensions of patient safety are measured according to the guideline of AHRQ of the HSOPS at the following level:</p> <p>1- Strengths Patient safety. 2- Neutral Patient safety culture. 3- Weakness Patient safety culture.</p>	<p>Nominal</p> <p>The scoring level (cut of points) is used as follows:</p> <p>1- Strengths Patient safety equal and more than 75%. 2- Neutral Patient safety culture is between 50% - 75%. 3- Weakness Patient safety culture is 50 % or fewer.</p>

Table 2: Operational definition of independent variables

No	Variable Name	Definition	Scale
1	Age	Age of physicians	Discrete in years- (6 groups): 1. Less than 25 years 2. 25 to 30 years 3. 31 to 35 years 4. 36 to 40 years 5. 41 to 45 years 6. 46 and more
2	Gender	The gender of physicians	Nominal- divided into: 1. male 2. female
3	Marital status	Marital status of physicians	Nominal- divided into: 1. single 2. married
4	Level of qualification	Qualification of physicians	Nominal- divided into: 1-Consultant 2 -Specialist 3 -General DR 4 -Resident
5	Experiences	How many years of working in hospital	Numerical- divided into: 1- Less than 1 year 2- 1 to 5 years 3- 6 to 10 years 4- 11 to 15 years 5- 16 to 20 years 6- 21 years or more
6	Duration of working at hospital work area / unit	Length of working in his\ her unit\ area	Numerical- divided into: 1- Less than 20 hours per week 2- 20 to 39 hours per week 3- 40 to 59 hours per week 4- 60 to 79 hours per week
7	Working hours per week in hospital	How many hours they spend in work in hospitals per week	5- 80 to 99 hours per week 6- 100 hours per week or more

Results

Out of 650 copies of the questionnaire distributed to the respondents, 384 obtained valid responses (response rate 66%). Physician's' characteristics are displayed in

Table (3) below as: Male 208 (54.2%); Married 236 (61.5%), Specialist 136 (35.4%); Yemeni 366 (95.3%). Majority of the respondents work in surgery (21.9%).

Majority of the respondents, 374 (97.4%), have typical contact with patients. Half of the respondents, 192 (50.0%), have (1-5 years)

experience. Majority of the respondents, 153 (39.8%), work for (20-39 hours) per week.

Table 3: Demographic characteristics of respondents

Characteristics	N	%	Characteristics	N	%
Gender			primary work area/unit		
Male	208	54.2	Many different hospital units /No specific unit	12	3.1
Female	176	45.8	Medicine (non-surgical)	55	14.3
Nationality			Surgery	84	21.9
Yemeni	366	95.3	Obstetrics	43	11.2
Non-Yemeni	18	4.7	Pediatrics	39	10.2
Marital status			Emergency department	29	7.6
Single	148	38.5	Intensive care unit (any type)	16	4.2
Married	236	61.5	Psychiatry/mental health	5	1.3
Qualification level			Rehabilitation	2	0.5
Consultant	46	12.0	Dermatology	4	1.0
Specialist	136	35.4	Dentist	29	7.6
General	130	33.9	Radiology	13	3.4
Resident	72	18.8	Anesthesiology	16	4.2
Working hours per week			Other	37	9.6
<20 hours	76	19.8	Experience (years of working in the hospital)		
20-39 hours	153	39.8	Less than 1 year	112	29.2
40-59hours	119	31.0	1 to 5 years	192	50.0
60-79 hours	23	6.0	6 to 10 years	53	13.8
≥80hours	13	3.4	11 to 15 years	17	4.4
Contact with patient directly			16 to 20 years	3	0.8
Yes	374	97.4	21 years or more	7	1.8
No	10	2.6			

Table (4) demonstrates all dimensions of patient's safety culture. The highest positive score was for team work within units (69.1%), followed by organizational learning-continuous improvement (51.6%), and then overall perceptions of safety (47.8%), whereas the lowest score was for Nonpunitive response to error (29.8%).

Comparison of means for two outcome dimensions scores with respondents' characteristics.

Table (5) shows a significant association between overall perception of safety and frequency of events reported with work

area ($p<0.05$), working hours per week ($p<0.001$). Age had association only with frequency of events reported ($P=0.017$).

Table (6) shows that (56.3%) of the respondents had not reported any event report in the past 12 months and (45.8%) of them rated patient safety level at public hospitals as acceptable.

Comparison of means between outcome and 12 dimensions of patient safety culture

Patient safety grade was significantly associated with most of compensation measures ($p<0.05$), except staffing ($p=0.229$) and teamwork across units

($p=0.070$), Table (7). Number of reported events was significantly associated with most of the composites ($p<0.05$), except

staffing ($p=0.534$), team work across units ($p=0.457$), and overall perception of patient safety ($p=0.099$).

Table 4: Dimension composites, items positive scores, and Cronbach's α test

Dimension	Strongly disagree/ disagree		Neither		strongly agree/ agree	
	F	%	F	%	F	%
Team work within unit (Cronbach's $\alpha = 0.60$)	69.1					
People support one another in this unit	52	13.5	20	5.2	312	81.3
When a lot of work needs to be done quickly, we work together as a Team to get the work done ⁹	58	15.1	55	14.3	271	70.6
In this unit, people treat each other with respect	39	10.2	42	10.9	303	78.9
When one area in this unit gets really busy, others help out	156	40.6	52	13.5	176	45.8
Supervisor expectation and action promoting patient safety (Cronbach's $\alpha = 0.84$)	48.4					
My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	96	25.0	42	10.9	246	64.1
My supervisor/manager seriously considers staff suggestions for improving patient safety	115	29.9	60	15.6	209	54.4
Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	159	41.4	66	17.2	159	41.4
My supervisor/manager overlooks patient safety problems that happen over and over	129	33.6	67	17.4	188	49.0
Organization learning continuous improvement (Cronbach's $\alpha = 0.80$)	51.6					
We are actively doing things to improve patient safety	94	24.5	50	13.0	240	62.5
Mistakes have led to positive changes here	153	39.8	65	16.9	166	43.2
After we make changes to improve patient safety, we evaluate their effectiveness	140	36.5	55	14.3	189	49.2
Management Support for Patient Safety (Cronbach's $\alpha = 0.80$)	43.6					
Hospital management provides a work climate that promotes patient safety	161	41.9	54	14.1	169	44.0
The actions of hospital management show that patient safety is a top priority	144	37.5	59	15.4	181	47.1
Hospital management seems interested in patient safety only after an adverse event happens	152	39.6	64	16.7	168	43.8
Overall Perception of Patient safety (Cronbach's $\alpha = 0.65$)	47.8					
Patient safety is never sacrificed to get more work done	97	25.3	62	16.2	224	58.5
Our procedures and systems are good at preventing errors from happening	136	35.4	47	12.2	201	52.3
It is just by chance that more serious mistakes don't happen around here	198	51.6	69	18.0	117	30.5
We have patient safety problems in this unit	111	28.9	52	13.5	221	57.6
Team work across units (Cronbach's $\alpha = 0.69$)	46.0					
There is good cooperation among hospital units that need to work together	131	34.1	66	17.2	187	48.7
Hospital units do not coordinate well with each other	153	39.8	47	12.2	184	47.9
Hospital units work well together to provide the best care for	134	34.9	69	18.0	181	47.1

patients						
It is often unpleasant to work with staff from other hospital units	186	48.4	58	15.1	140	36.5
Staffing (Cronbach's $\alpha = 0.54$)	43.8					
We have enough staff to handle the workload	181	47.1	26	6.8	177	46.1
Staff in this unit work longer hours than is best for patient care	168	43.8	46	12.0	170	44.3
We use more agency/temporary staff than is best for patient care	212	55.2	72	18.8	100	26.0
We work in "crisis mode" trying to do too much, too quickly	115	29.9	65	16.9	204	53.1
Handoffs and transitions (Cronbach's $\alpha = 0.71$)	38.2					
Things "fall between the cracks" when transferring patients from one unit to another	116	30.2	74	19.3	194	50.5
Important patient care information is often lost during shift changes	170	44.3	47	12.2	167	43.5
Problems often occur in the exchange of information across hospital units	143	37.2	68	17.7	173	45.1
Shift changes are problematic for patients in this hospital	158	41.1	67	17.4	159	41.4
Non punitive response to error (Cronbach's $\alpha = 0.54$)	29.8					
Staff feel like their mistakes are held against them	126	32.8	81	21.1	177	46.1
When an event is reported, it feels like the person is being written up, not the problem	112	29.2	69	18.0	203	52.9
Staff worry that mistakes they make are kept in their personnel file	105	27.3	58	15.1	221	57.6
Dimension	Never/ Rarely		Sometimes		Most of Time/ Always	
	F	%	F	%	F	%
Feedback and Communication about error (Cronbach's $\alpha = 0.77$)	41.7					
We are given feedback about changes put into place based on event reports	158	41.1	113	29.4	113	29.4
We are informed about errors that happen in this unit	101	26.3	105	27.3	178	46.4
In this unit, we discuss ways to prevent errors from happening again	104	27.1	91	23.7	189	49.2
Communication openness (Cronbach's $\alpha = 0.54$)	37.5					
Staff will freely speak up if they see something that may negatively affect patient care	104	27.1	111	28.9	169	44.0
Staff feel free to question the decisions or actions of those with more authority	135	35.2	115	29.9	134	34.9
Staff are afraid to ask questions when something does not seem right	129	33.6	138	35.9	117	30.5
Frequency of events reported (Cronbach's $\alpha = 0.85$)	34.4					
When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?	159	41.4	113	29.4	112	29.2
When a mistake is made, but has no potential to harm the patient, how often is this reported?	170	44.3	87	22.7	127	33.1
When a mistake is made that could harm the patient, but does not, how often is this reported?	140	36.5	87	22.7	157	40.9
F= Frequency						

Table 5: Comparison of means for two outcome composite scores according to respondent characteristics

Respondents characteristics	Overall Perception of Safety			Frequency of Events Reported		
	Mean	SD	p- value	Median	IQR	p- value
Work area/unit in this hospital			0.033			0.051
Many different hospital units	3.1	.51		1.0	0.00	
Medicine (non-surgical)	3.1	.79		1.0	2.00	
Surgery	2.7	.80		2.0	1.50	
Obstetrics	2.7	.75		1.0	1.00	
Pediatrics	3.0	.95		1.0	1.00	
Emergency department	3.0	.94		2.0	2.00	
Intensive care unit (any type)	2.8	.86		2.0	2.50	
Dentist	3.0	.87		1.0	0.00	
Radiology	3.0	.58		1.0	2.00	
Anesthesiology	2.4	1.15		2.0	3.00	
Other	3.2	1.02		1.0	1.00	
Age			0.069			0.017
less than 25	3.1	0.92		1.0	1.00	
25 to 30 years	2.8	0.85		1.0	2.00	
31 to 35 years	2.9	0.87		1.0	1.00	
36 to 40 years	3.2	0.87		1.0	2.00	
41 to 45 years	2.9	0.89		2.0	2.00	
46 and more	2.5	0.73		2.0	2.75	
Qualification level			0.736			0.075
Consultant	2.8	0.87		2.0	2.00	
Specialist	2.9	0.81		1.0	2.00	
General doctor	2.9	0.96		1.0	1.00	
Resident doctor	2.9	0.83		1.0	1.00	
Years of working in hospital			0.132			0.095
Less than 1 year	2.9	0.89		1.0	1.00	
1 to 5 years	3.0	0.86		1.0	1.00	
6 to 10 years	2.6	0.74		2.0	2.50	
11 to 15 years	2.8	1.01		1.0	1.50	
16 to 20 years	3.3	0.58		2.0		
21 years or more	3.0	1.15		1.0	1.00	
Working hours per week in hospital			<0.001			<0.001
Less than 20 hours per week	3.1	0.81		1.0	1.00	
20 to 39 hours per week	3.0	0.88		1.0	2.00	
40 to 59 hours per week	2.7	0.83		2.0	2.00	
60 to 79 hours per week	2.4	0.79		2.0	3.00	
80 to 99 hours per week	2.4	0.98		1.0	1.00	
100 hours per week or more	2.3	1.03		2.5	2.00	

Table 6: Grade of patient safety and numbers of event report

		F	%
An overall grade on patient safety	Excellent	17	4.4
	Very Good	104	27.1
	Acceptable	176	45.8
	Poor	75	19.5
	Failing	12	3.1
No of event reports in the past 12 months	no event report	216	56.3
	1 to 2 event reports	76	19.8
	3 to 5 event reports	44	11.5
	6 to 10 event reports	28	7.3
	11 to 20 event reports	14	3.6
	21 event reports or more	6	1.6

Table 7: Comparison of means between patient safety grade, and number of reported events with patient safety culture composites scores

	Patient Safety Grade								Number of Events Reported							
	Failing /Poor		Acceptable		Very Good /Excellent		F	P	0		1 - 5		> 5		F	P
	M	SD	M	SD	M	SD			M	SD	M	SD	M	SD		
Teamwork Within Units	3.1	0.81	3.6	0.62	3.9	0.62	34.76	<0.001	3.5	.73	3.7	.76	3.8	.51	5.58	.004
Supervisor expectation and action promoting patient safety	2.7	0.84	3.2	0.63	3.4	0.68	26.30	<0.001	3.1	.77	3.2	.73	3.6	.45	9.64	<0.001
Organization learning continuous improvement	2.5	0.89	3.2	0.79	3.7	0.80	55.15	<0.001	3.0	.91	3.4	.89	3.6	.82	16.16	<0.001
Management Support for Patient Safety	2.5	0.70	3.0	0.66	3.4	0.51	50.64	<0.001	2.9	.75	3.1	.61	3.3	.56	9.56	<0.001
Overall Perception of Patient safety	2.9	0.69	3.2	0.56	3.2	0.58	7.13	0.001	3.1	.64	3.2	.52	3.1	.64	2.33	.099
Feedback and Communication about error	2.5	0.95	3.0	0.77	3.6	0.79	53.56	<0.001	2.9	.90	3.2	.92	3.8	.66	22.18	<0.001
Communication openness	2.6	0.71	3.0	0.64	3.3	0.69	22.82	<0.001	2.9	.77	3.1	.60	3.3	.53	9.31	<0.001
Frequency of events reported	2.1	0.94	2.7	1.03	3.6	0.93	60.27	<0.001	2.5	1.09	3.1	1.06	3.5	.97	20.91	<0.001
Team wok across units	3.0	0.65	3.1	0.49	3.0	0.55	2.68	0.070	3.1	.60	3.0	.51	3.1	.40	0.78	.457
Staffing	2.9	0.72	3.0	0.65	3.0	0.62	1.48	0.229	3.0	.67	3.0	.66	2.9	.57	0.63	.534
Handoffs and transition	3.5	0.78	3.2	0.72	2.7	0.72	33.84	<0.001	3.3	.75	2.9	.76	2.6	.80	18.80	<0.001
Nonpunitive response to error	3.4	0.84	3.3	0.73	3.0	0.90	6.10	0.002	3.3	.78	3.3	.84	2.7	.82	11.83	<0.001

M= Mean, SD = stranded division

Discussion

This study used HSOPSC to measure patient safety culture among physicians at public hospitals in Sana'a, Yemen. Response rate was 66% higher than AHRQ 61% [18]. All dimensions of patients safety culture were neutral, with positive response scores lower than 75%. Mean age of physicians was 2.8 ± 1.24 years. Specialists were 136 (35.4%) of the respondents, in which (21.9%) of them had been working in surgery. Majority of the respondents had typical contact with patients 374 (97.4%). Half of the respondents, 192 (50.0%), had 1-5 years' experience whereas 153 (39.8%) of them had 20-39 working-hours per week.

The highest score of patient safety dimensions was in team work within units (69.1%), followed by organizational learning-continuous improvement (51.6%), while the lowest score was in Nonpunitive response to error (29.8%). In addition (56.3%) of the respondents had not been reporting any event report in the past 12 months. There was a significant association between overall perception of safety and frequency of events reported with work area ($p < 0.05$) and working hours per week ($p < 0.001$).

Team work within units scored the highest positive response rate, similar to some other studies [14, 15, 18]. It means that the staff show support and respect in their unit or department, they are cooperative, and they coordinate the work as a team. It had a significant association with patient safety level and number of events reported. Although it was higher than in Ain-shams (58%) [13], it was lower than in Saudi

Arabia 84% [12], USA(80%) [19] and Palestine (71%) [14].

Safety culture includes three major components, a just culture, a reporting culture and a learning culture [1] Event reporting as an essential component for achieving learning culture, can happen in a non-punitive environment where events can be reported without people being blamed [20] Our result of non-punitive response to error had the lowest score, revealing that half of the physicians were not reporting errors. That is to say, most of them were afraid of committing mistakes, feeling like unwilling to write up any problem. Therefore, organization learning continuous improvement was low. This result comes in line with some other studies stating that training opportunities empower physicians to improve patient safety are limited, thus investing the importance of training is important to improving patient safety outcomes²¹. However, non-punitive responses to error in this study was higher than in Saudi Arabia (22%) [12], Ain-shams (19.5%) [13], Turkey (18%) [22] and Palestine (17%) [14], but lower than in the USA (44%) [19]. Frequency of events reported was higher than in Turkey (12%) [12] and Ain-shams (33.4%) [13], but lower than in Palestine (35%). [14] Learning continuous improvement was lower than in the USA (72%) [19], Palestine (62%) [14], Ain shams (78.2%) [13] and Saudia Arabia (84%) [12]. All the three dimensions had significant association with patient safety grade and number of events reported. To have successful patients safety program there is

a need for strong leadership to create the suitable culture and commitment necessary to solve underlying system causes of medical errors, and to avoid any harm to patients. As the managers practice the culture of safety, the whole organization staff will follow all principles of patient safety culture [2]. Our results showed low support from hospital management for patient safety as signified in the low frequency of events reported, and the limited likelihood of having a better overall perception of safety among respondents. This result is in consistency with most of previous study [12-15, 19].

Effective communication within and across healthcare providers are important to remove any harms to patients; the highest contributing factor to adverse events is defect of communication [17]. The results showed low scores of communication openness, feedback and communication about error. This led to the decreased frequency of events reported, in support of the significant association between number of events reported and patient safety level. Moreover, low scores on communication, and hospital handoffs and transitions reduced the likelihood of having a better perception of safety among respondents. Teamwork across units was higher than in Ain shams [13] and Saudi Arabia [12], but lower than in the USA [19]. Handoff and transition was higher than in Ain shams [13].

Staffing received a low score. Staff is the most predictor of patient safety, its strong capability and motivated workforce are among of the biggest challenges for hospitals today². A strong correlation

between the availability of healthcare providers and population health outcomes has been approved [2]. Our results showed less positive score on staffing, representing the decreased likelihood of the respondents to show a higher level of patient's safety, and their reduced likelihood to report the events, problems and mistakes related to patient care and safety.

Overall perception of patient's safety culture is an indicator of good procedures and systems for preventing errors and the lack of patient safety problems [6.7]. The respondents' positive response was weak in this concern (47.8%), lower than in the USA (62%) [19], Turkey (59%) [22], but higher than in Ain shams (27.2%) [13]. It had a significant association with working hours per week, and work area. Its weakness was reflected in all dimensions.

Patient safety level association with the overall perception and with majority of dimensions was acceptable in this study, unlike in Saudi Arabia which was excellent and in Palestine it was very good.

More than half of the respondents did not report any event report during the past 12 months, reflecting low perception about patient safety culture and conforming a significant association between most of dimensions and the number of events reported.

Conclusions

Patient safety is a minor priority at Yemeni public hospitals, there is a tendency for under reporting of errors whether harmful to patients or not. Error reporting is an important determinant of patient safety culture. To create culture of safety and

improvement fear of blame must be eliminated, so as to eradicate the prevalent culture of blaming. All dimensions of patient safety culture recorded low scores of positive responses, reflecting the need for improvement. Such improvement requires system changes, such as creating a climate of open communication, fostering continuous learning and focusing on leadership quality, because they are essential elements for effective improvement of patient safety. The outcomes of study are expected to help policy makers make important decisions towards the improvement of patient safety. Finally, more studies are suggested to be conducted on the weak areas of patient safety and how to improve it.

Recommendations

Administration staff of public hospitals, the Ministry of Public Health and the leaders of healthcare organizations in Yemen are recommended to give patient safety a top strategic priority. Hospital management should assess and redesign their current patient's safety system. Blame-free system for identifying threats to patients, sharing information, and learning from events should be all functional components of collaborative environment.

Advantages and Limitations

This is the first study on patient safety culture at public hospitals in Sana'a, Yemen. The results of the study provide some evidence to help the concerned Yemeni decision makers develop effective strategies to improve health care quality and to ensure patient safety. However, our study was limited to a small number of respondents which may not reflect the

whole picture of patient safety culture of all healthcare provider in Sana'a.

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Giant Cerebral Cavernoma: A Case Study

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Abstracts

Background: Cavernoma is known as cavernous malformation or cavernous angioma. It accounts for 0.5% of brain mass lesions. Giant cavernomas of the central nervous system is quite rare, only 65 cases of cerebral giant cavernous angioma have been included in literature over the last 62 years. They are more common in children and may be misdiagnosed as other intracranial neoplasms. This study presented a very rare giant cavernoma extended from right basal ganglia to the sylvian fissure in a 7-year-old female.

Case description: A 7-year-old female presented with the new onset of recurrent attacks of seizures, with progressive left-sided hemiplegia for the last month. The clinical examination showed that the patient was sleepy and had left-sided hemiplegia. A non-contrast CT scan revealed a spherical slightly hyperdense intraaxial lesion at the right basal ganglia extended to the sylvian fissure measuring 5x4.5x5 cm surrounded by moderate perifocal edema. A brain CT scan, with contrast, revealed slight patchy enhancement. MRI revealed a single large lesion occupying the right basal ganglia extended to the sylvian fissure measuring 5x4.5x5 cm and showed a patchy enhancement. The patient underwent craniotomy through the right fronto-temporal and transsylvian approach, under surgical microscope, with total en bloc resection of lesion. The histopathologic examination revealed cavernous hemangioma (cavernoma). After surgery, she was conscious alert, with no new neurological deficit apart from the pre operation Left-sided hemiplegia. The postoperative follow-up was uneventful with a significant improvement in her left-sided hemiplegia after 3 months.

Conclusion: Pediatric giant cavernous angioma is a rare intracranial lesion that may be best diagnosed with MR/CT, but sometimes, confirmation requires histopathological examination. It should always be included in the differential diagnosis of spontaneous intracerebral hemorrhages or large tumor. The best outcomes correlate with surgical excision, but may be, limited by eloquent tumor location.

In our case, we report a rare case of giant cavernoma that was completely removed by microsurgical treatment. This case provides important points for the practicing neurosurgeon to consider when making a differential diagnosis of large intracranial tumors. Since imaging

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appearance of giant cavernoma is variable, the possibility of cavernoma should be considered in the case of a large tumor.

Efficacy of Oral Isotretinoin in Combination with Desloratadine in the Treatment of Acne Vulgaris at Al-Thawra General Hospital, Sana'a, Yemen

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Abstracts

Background: Acne vulgaris is one of the most common skin problems in adult life, especially in adolescents.

Objective: This study aimed to evaluate the efficacy of oral isotretinoin in combination with desloratadine in the treatment of acne vulgaris at Al-Thawra General Hospital, Sana'a.

Methods: The study was designed as a prospective comparative clinical trial carried out in the Department of Dermatology, Al-Thawra General Hospital, Sana'a during the period from Jan. to June 2019. The data were collected from each patient after verbal consent. All patients (60 pt.) were randomized into 2 equal groups (study group and control group). The mean age of the study group was 27.47 ± 4.249 year while 24.07 ± 3.393 year of the control group. Both groups were treated with isotretinoin 20mg per day for 16 weeks. The study group (combined treatment) received 5mg desloratadine daily in 16 weeks. The follow-up was carried in weeks (2, 4, 8, 12, 16) for acne lesion, GAGS score, side effects of drugs and outbreak of acne.

Results: This study found that females were more affected than males and acne lesion at 16 weeks was 16.7 % in the study group in contrast to 40.0 % in the control group. After 16 weeks of treatment, GAGS score showed that both groups had good outputs response to therapy with 86.7% excellent and 13.3% good in the study group compared to 56.7%, excellent, and 40 % good response to therapy. Whereas at 16 weeks most patients had no outbreak (86.7 % in the study group and 53.3 % in the control group), 3% in the study group and 46.7 % in the control group had mild outbreak with > 5 nodules. This study observed only minor side effects of desloratadine among the study group, such as headache and self-limited infection. Side effects of isotretinoin declined more rapidly when desloratadine was added. **Conclusion:** This study showed that adding oral desloratadine to the oral isotretinoin provides a better outcome and advantage in terms of efficacy and tolerability than isotretinoin treatment alone.

**Prevalence of psoriatic arthritis in psoriatic patients attended
AL-Thawra Teaching General Hospital in Sana, a, Yemen**

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Abstracts

Background: Psoriatic arthritis is a chronic inflammatory arthropathy that occurs in individuals with psoriasis.

Aim: To determine the prevalence of psoriatic arthritis in psoriasis patients attending AL-Thawra Teaching hospital in Sana'a, Yemen.

Methods: 206 patients with psoriasis were enrolled in across sectional study for one year. Details of demographic factors, history, clinical types and location of the psoriasis were all recorded. Severity of the disease were assessed by using the psoriasis area and severity index (PASI). Patients were examined for signs of arthropathy and the rheumatoid factor and radiological investigations were carried out in suspects cases.

Results: 17(8.25%) out of 206 suffered from psoriatic arthritis (PsA) with higher in males (58.82%). Family history in (29.41%) of PsA versus (10.63%) of psoriasis without PsA with P-value(0.001). Nail involvement significantly associated with PsA in (88.24%). Chronic plaque psoriasis the most common type associated with PsA and with higher PASI in PsA. Asymmetric oligoarthropathy was the most common features in PsA. Skin lesions precede arthropathy in all patients with psoriatic arthritis.

Conclusions: Dermatologist the first physician who should establish the diagnosis of psoriatic arthritis and start treatment to prevent the progression of the articular damage.

**Effect of Pulse Steroid Therapy on Visual Acuity and Fundus
Picture in Cases of Vogt Koyanagi Harada Syndrome in
Yemen: Case Series Study**

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Abstracts

Vogt-Koyanagi-Harada syndrome (VKHS) is a rare systemic disease with severe bilateral panuveitis associated with cutaneous, neurological, and auditory abnormalities. This study aims to evaluate the effect of pulse steroid therapy on the visual acuity and fundus picture of cases of VKHS presented at Maghrabi Eye Hospital in Yemen. Method: This retrospective case series was followed up for three years between (2007-2010) for three female patients who presented by bilateral hand motion and complained with headache, neck stiffness and difficulty in hearing. Results: After pulse steroid therapy, the best corrected visual was improved with resolution of optic disc swelling and serous retinal detachment detected by optical coherence tomography (OCT). One eye had complication as sunset glow and suprarational fibrosis. Conclusion: VKHS is uncommon disease in Yemen and affects mostly female. Urgent intervention with pulse steroid therapy and systemic corticosteroid and early diagnosis decrease the complications and improve the visual acuity.

Key words: Vogt Koyanagi Harada syndrome, pulse steroid therapy, visual outcome, Yemen.

**The Effect of Having Hemorrhoids and Hemorrhoidectomy
on the Sexual Activity of Yemeni Male Patients Prospective
study of 600 Cases**

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Abstracts

Introduction: Haemorrhoids and Erectile dysfunction (ED) are a highly prevalent conditions among men in Yemen. Both are associated with undiagnosed medical diseases as chronic pelvic pain and obstructive defecation.

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Objective: The purpose of this study was to study the prevalence of having haemorrhoids and erectile dysfunction and the out come post surgical hemorrhoidectomy on sexual function in those adult men patients.

Materials and Methods: In cross sectional and prospective study, we studied the prevalence of having both haemorrhoids and erectile dysfunction and the effect of surgical hemorrhoidectomy on erectile function. Prospective study of 600 male patients, with mean age 39 years (18-50). We divided them in to 2 groups,300 each. Test group(1) having haemorrhoids and ED selected for surgery and control group (2) having haemorrhoids and ED selected for non surgical treatments. 136 patients were excluded from 1st group and 140 patients were excluded from 2nd group. 164 patients were remained from 1st group and 160 patients were remained from the 2nd group. Hemorrhoidectomy was carried out in 164 patients with clinical hemorrhoids grade 3 or 4 associated with ED (Group 1) and compared with 160 patients without operative intervention (Group 2; control) with the same age group. The primary efficacy variables was done by interviewing the patients at 3 and 6 months interval post haemorrhoidectomy in term of sexual function (SF), orgasmic function, sexual desire, intercourse satisfaction , and overall satisfaction.

Results: Almost all patients having haemorrhoids also reported some sort of ED. In Group 1, the complain of erectile dysfunction improved significantly after hemorrhoidectomy ($P < 0.001$). 103 patients (61.6%) showed improvement of EF compared to 5.3% in the control group ($P < 0.001$).

Conclusions: Both haemorrhoids and ED are highly prevalent among Yemeni Patients. In the first instant, most adult men patients with haemorrhoids are seeking surgical treatments when they have ED or decrease sexual function in order to improve their sexual activity. We concluded that surgical haemorrhoidectomy is clearly related to improvement of EF in male hemorrhoid patients with ED.

Keywords: Erectile dysfunction, erectile function, haemorrhoidectomy

**Beyond TME for Locally Advanced and Recurrent Rectal
Cancer; A Retrospective Study In 24 Patients**

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Abstracts

Introduction: There have been significant advances in the surgical management of locally advanced and recurrent rectal cancer in recent decades. Patient with advanced rectal cancers involving adjacent organs and neurovascular structures, beyond the traditional mesorectal planes, who would have traditionally been considered irresectable at many centres, now undergo surgery by pelvic exenteration routinely. While high rates of morbidity and mortality were reported by the pioneers of pelvic exenteration (PE) in early literature, this is now considered historical data. As a result, Pelvic Exenteration (PE) is now performed routinely at increasing rate offering our patients a chance of long-term survival with acceptable morbidity and quality of life. This paper describes the surgical techniques that we have been performed for radical multivisceral pelvic resections and their outcomes regarding only rectal cancers, excluding those with distant metastases or other pelvic cancers.

Methods and Results; Retrospective study for our 24 Patients who underwent Pelvic Exenteration (PE) for advanced or recurrent rectal cancer in 5, public and private, hospitals between the period June 2008 to June 2023. The majority were male patients with locally advanced cancers. Majority of our females' patients underwent PE were recurrent rectal cancer post abdominoperineal resection were done in our site centers for mucinous signet ring primary adenocarcinomas. Clear R0 were achieved in almost all cases. All cases were axial or central without lateral pelvic involvement.

We got reasonable rates of long-term survival (up to 60 % at 5 years) and acceptable morbidity and quality of life.

Conclusions: Patients with locally advanced or recurrent rectal cancers beyond TME or with multi visceral pelvic involvement without distant metastases are candidates for pelvic exenteration surgery. Achieving R0 resection with acceptable morbidity has become the ultimate goal of curative exenterative surgery and demonstrated to be the most important factor in predicting both long-term survival and postoperative quality of life.

Keywords: Pelvic exenteration (PE); locally advanced rectal cancer; recurrent rectal cancer; posterior vaginectomy.
