



REFLECTION OF THE BURDEN OF HEADACHE AND FACIAL PAIN ON THE COMMUNITY AND UNDERLYING PATHOLOGIES: A PROSPECTIVE STUDY FROM BENGHAZI LIBYA

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ABSTRACT:

BACKGROUND: Headache is the most common cause of neurological referral.

An International Classification for headache produced by the International Headache Society (IHS) is regularly updated.

OBJECTIVES: The aims of the study were to define prospectively the clinical and economic burden of the different types of headache and cranio-cervical pains in 202 patients referred to Benghazi neurological clinics.

METHODS: 202 adult Libyan patients with headache referred to the neurology clinics and emergency rooms of Benghazi Teaching Hospitals, Libya, (80 males and 122 females) were studied prospectively both clinically and using a questionnaire.

RESULTS:

Stress was a prominent trigger for headache in 91.6%, the most common comorbidity was arterial hypertension in 27.7%. The most common single primary headache was migraine in 47%, followed by tension headache in 20.8%, both types occurred in 6.4% patients, and the most common single causes of secondary headaches were sinusitis 9.4% and cervicogenic headache 8.9%, analgesia excess headache occurred in 27.7%.

Genetic phenotypes were found in 11.9% patients and epilepsy in 16.3%. Most of the patients were highly educated 62.6% but, only 42.6% had an economical status consistent with a professional of their educational level. The patients who were aware that headache prophylaxis is possible were 31.7% and 62.3% were imaged. Further analysis of the headache types, trigger and relieving factors and management was performed in this study.

CONCLUSION: Educating students, medical and paramedical staff into the various aspects of the pathophysiology and management of headaches and facial pains can have huge economical and health-related beneficial impact.

Keywords: Headache, Facial pain, Management, Types, Benghazi, Libya

INTRODUCTION

Headache is a common neurological condition and the most frequent cause of neurological outpatient consultations. The headache is classified according to International Headache Society (IHS) criteria to primary and secondary headaches as well as painful cranial neuropathies, other facial pains and other headaches. (1)

Most headaches are benign rarely signifying serious underlying pathology which may still happen, and therefore are still a source of concern for both referring clinicians and patients. (1)

Benghazi is the second largest city in Libya with a population of around one million. At present it is working three large teaching hospitals providing emergency services and both general and specialist care to a catchment area that includes almost the whole of the Eastern sector of Libya (population around two millions).

Benghazi also has two medical Universities: Benghazi University and The Libyan International Medical University. Politically, Benghazi and Libya in general are unstable with intermittent military clashes.

Little is known about the frequency of Headaches and cranial pains in Libya at present and therefore this study aimed to define prospectively the clinical burden of the different types of headache in the city of Benghazi, Libya.

METHODS

Patients with headache, who were seen in the neurology clinics and emergency rooms of the Benghazi Hospitals, from 1st October 2014 until 31st January 2016 were prospectively recruited in the study. The study locations were: Benghazi Medical Center Neurology Clinic, Benghazi Medical Center Emergency Room, The Neurology Clinic at 7th October Hospital, and Benghazi

University Specialist Medical Service Neurology Clinic. The patients were consented and subjected to a detailed questionnaire especially designed for the study by the researchers. The questionnaire covered the aspects of a standard patient history, concentrating on the neurological headache history, clinical examination, and to date related brain imaging is also recorded. The questionnaire was based on the current International Headache Association Criteria.(1,2,3,4,5,) All the data collectors were trained prior to the study and were provided with a printed copy of clinical headache diagnostic guidelines based on the International Classification for headache produced by the IHS(1). The main exclusion criterion was the patient's own refusal to take part in the study. Statistical Analysis: Standard statistical methods using an SSPS 18 Package were used by us to analyse the results. Graphs were formulated with Microsoft Word Excel. The study was approved ethically by Benghazi Medical Centre Medical Research Committee.

RESULTS:

The main study results may be summarized as follows:Of the 202 patients who were recruited into the study 60.4% (122) were females and 66% patients were aged 15-40 with 2.5% above the age of 66 years. Table .1 New daily persistent headache occurred in 67 (33%), Chronic daily headache in 116 (57%) and Acute headache not fitting with either classification in 19 (9%), Figure 1A. Primary headache occurred in 41.1 % (83) of patients while 28.2% (57) had secondary headache the rest had a combination of both. The most frequent primary headache was migraine (47 %(95) of patients) while trigeminal neuralgia (2%) and glossopharyngeal neuralgia (0.5 %) were rare.Tension headache occurred in 26.8% of patients. A combination of tension and migraine was reported in 6.4% of patients. Sinusitis occurred in 9.4 % (19), cervicogenic headache 8.9% (18), idiopathic intracranial hypertension/cerebral sinus thrombosis 6.4% (13) . Cluster headache occurred in only 1.5% and Paroxysmal hemicrania in 1.0%. Temporal Arteritis was reported in two patients (1%) only. , Figures 1B and 1C. Analgesia overuse headache was present in 27.7 % (56) and its relationship to the different headaches is shown in Figure.2. Genetic phenotypes were found in 11.9% patients (Figure.3) and epilepsy in 16.3% (Figure.4). The most frequent comorbidity was arterial hypertension which occurred in 27.7% (56). Co-Morbidities are shown in Table.2. Around 64% of the patients had received some form of radiological imaging for their headache and 62.3%were imaged by either CT or MRI . 20% of all the headache patients and 32% of the 126 imaged patients (40 patients)had findings on scanning the brain. Most of the patients were highly educated 62.6% but, only 42.6% had an economical status consistent with a professional of their educational level. Stress was the most important trigger in 17.8% and 50% patients were relieved of their headache by analgesia.

The patients who were aware that headache prophylaxis is possible were 31.7 %. Analgesia had been prescribed for 70.3% (142) patients. Prophylaxis however had been prescribed for only 27.2 %(55), Figure.5. Specialists prescribed 71% (44) of the cases of prophylactic headache treatment, while Junior staff albeit

Table.1 Age Distribution

AGE	Number of Patients	Percentage
15-20	9	4.5%
21-25	35	17.5%
26-30	34	17%
31-35	24	12%
36-40	30	15%
41-45	27	13.5%
46-50	11	5.5%
51-55	11	5.5%
56-60	8	4%
61-65	8	4%
66-70	2	1%
71-75	2	1%
76-over	1	0.5%

trained to take histories in headache patients saw 72.7% of the patients. The emergency room was the site of first contact for 50% of the patients.

FIGURES AND TABLES:

In age group 21-30 years (69 patients), 26 were male (38%) and 43 females (62%). As shown most of the patients were between ages 21- 45 years.

Figure.1.A Clinical Presentations of Headaches

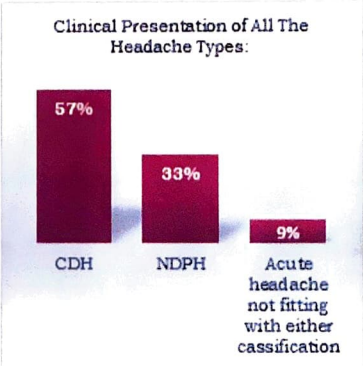


Figure .1B Types of Primary Headaches

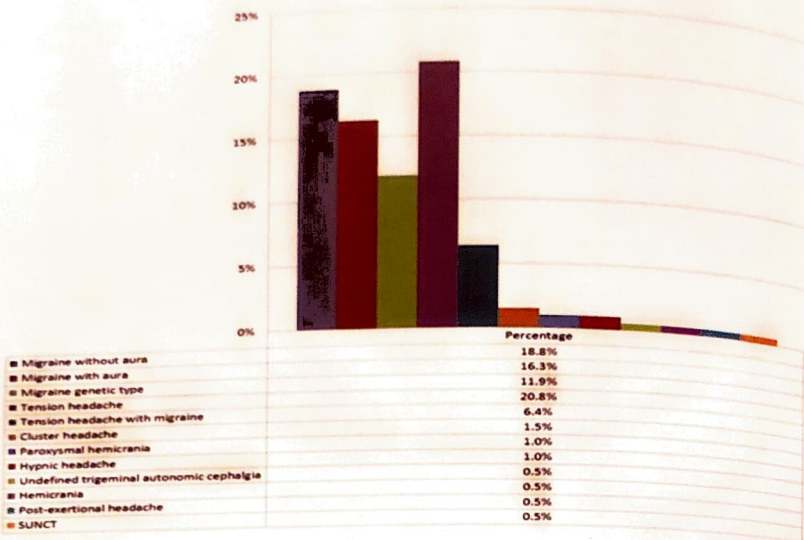
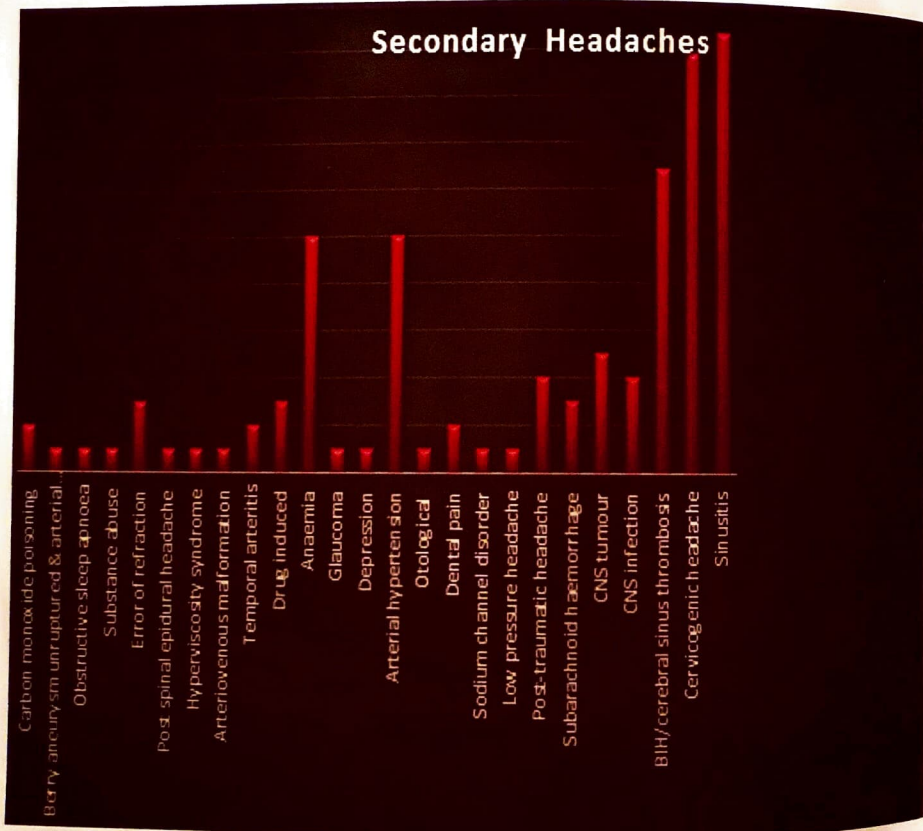


Figure.1C The Types of Secondary Headaches



With regard to secondary headaches: Sinusitis occurred in 9.4 % (19), cervicogenic headache 8.9% (18), idiopathic intracranial hypertension/cerebral sinus thrombosis 6.4% (13), anaemia 5% (10), arterial hypertension 5% (10), CNS tumour 2.5% (5), CNS infection 2% (4), subarachnoid haemorrhage 1.5% (3), post-traumatic headache 2% (4), drug induced 1.5% (3), low pressure headache 0.5 % (1), temporal arteritis 1% (2), post spinal epidural headache 0.5 % (1), arteriovenous malformation 0.5% (1), berry aneurysm unruptured and arterial hypertension 0.5% (1), glaucoma 0.5% (1), sodium channel disorder 0.5 % (1), dental pain 1% (2), otological 0.5% (1), hyperviscosity syndrome 0.5 % (1), depression 0.5% (1), Error of refraction 1.5% (3), substance abuse 0.5% (1), obstructive sleep apnoea 0.5% (1), and carbon monoxide poisoning 1 % (2).

The different types of secondary headaches are shown in Figure. 1C

Analgesia excess headache was present in 27.7 % (56) patients with headaches. It occurred in different headaches as follows (Figure.2):

- Tension headache 15 (26.8%)
 - Migraine without Aura 12 (21.4%)
 - Migraine with Aura 9 (16.1%)
 - Genetic Migraine 7 (12.5%)
 - Tension and Migraine 5 (9%)
 - Paroxysmal Hemicrania 1(1.8%)
 - Cervicogenic headache 2 (3.6%)
 - Epilepsy presenting as headache 2 (3.6%)
 - Epilepsy with Headache 1 (1.8%)
 - Arteriovenous Malformation AVM 1 (1.8%)
 - Benign Intracranial Hypertension BIH 1 (1.8%)
 - Temporal Arteritis 1 (1.8%)
- Genetic History:

A highly suggestive genetic association was available in 11.9 % (24) only .Familial Hemiplegic Migraine type 1 (FHM1) occurred in 4.5% (9),Familial Hemiplegic Migraine type 2 (FHM2) in 2.9% (6), Mitochondrial disorder in 2% (4),Channelopathy in 1.5% (3),Familial Basilar Migraine (FBM) in 0.5% (1), and with fugue (and epilepsy) in 0.5% (1).Figure.3 Family History of Any type of Headache:

A family history of any headache: Was positive in 38.1% (77) and negative in 57.4% (116), in 4.5% (9) there were no available data. 27.7% of the patients with migraine had epilepsy as well 54.5% of the epilepsy patients with headaches had migraine as the cause of their headaches Epilepsy in Association with Headache: 16.3% (33) of the patients who presented with headache had epilepsy, 11% (22) were known to have epilepsy and 5% (11) presented with headache only, and were later found to have epilepsy as the main cause of their headache. 4.9% (10) patients had both epilepsy and genetic migraine. Secondary causes of headache were present in 14 (6.9%), of those 2 (1%) also had tension headache. Classical migraine was present with epilepsy in 6 (2.9%) patients, migraine with aura 2 (1%) and trigeminal autonomic cephalgia in 1 (0.5%). Family history of migraine was available in 4% (8) patients with epilepsy.Figure.4

Figure.2 Headaches Associated with Analgesia Excess Headache

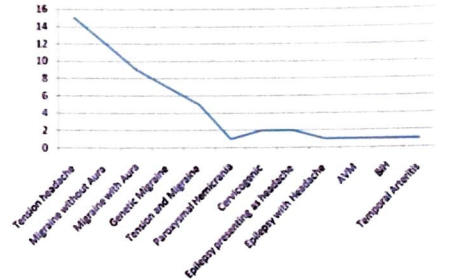


Figure.3 Clinical Phenotypes of Genetic Migraine

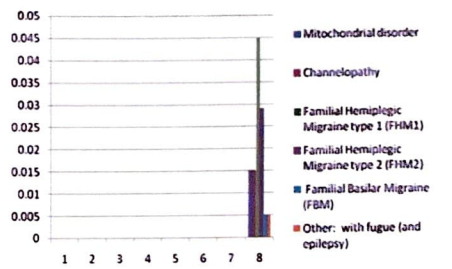


Figure.4 Epilepsy and Headache

Features and Subtypes of Headaches in Patients with Epilepsy and Headaches

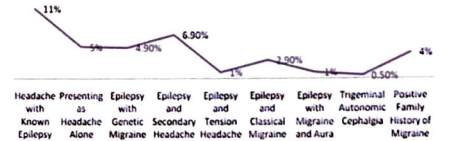


Figure.5 Treatment of Headache and Facial Pain

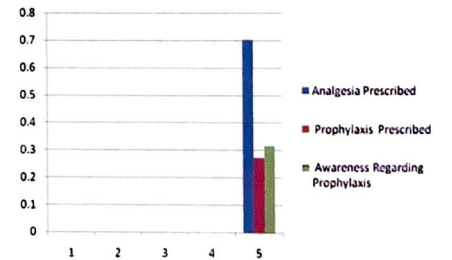


Table.2 Comorbidities with Headaches:

(No co morbidities 47.5% (96
(Arterial Hypertension 27.7% (56
(Diabetes Mellitus 2.5% (5
(Multiple sclerosis 1% (2
:Others 21% (43) Divided as follows
:Cardiac comorbidities
(Ischaemic heart disease 5 (2.5%
(Dilated cardiomyopathy 2 (1%
(Aortic stenosis 1 (0.5%
(Hypothyroidism 7 (3.5
(Craniogenic diabetes insipidus 1 (0.5%
(Pituitary adenoma treated 1 (0.5%
(Bronchial asthma 2 (1%
(Tuberculosis 1 (0.5%
Neuromuscular and Neurological
(Spinal disc prolapse L/5 1 (0.5%
(Myasthenia gravis 1 (0.5%
(Ovarian cyst 2 (1%
Gastroenterological
(Coeliac disease 3 (1.5%
(Irritable bowel disease 5 (2.5%
(chronic gastritis 2 (1%
(Chronic constipation 1 (0.5%
(Anorexia nervosa 1 (0.5%
Systemic lupus erythematosus 1 (0.5%

Table. 3 Epidemiology of Headache Comparison of This Study with Others

Region	Libya this study	Africa	Arab World**	Americas	EASTERN Mediterranean	Europe	South EAST Asia	Western Pacific
All Headache	21.5 (n=2)	21.6 (n = 2)	12.1	46.5 (n=1)	78.8 (n=2)	56.1 (n=8)	63.9 (n=1)	52.8 (n=4)
Migraine	47 (n=1)	4.0 (n=2)	5.0	10.6 (n=1)	6.8 (n=2)	14.9 (n=9)	10.9 (n=1)	10.4 (n=6)
Tension type headache	20.8 (n=1)	nr	9.5	32.6 (n=1)	nr	80* (n=2)	34.8 (n=1)	19.7 (n=3)
Medication overuse headache	27.7 (n=1)	nr	nr	nr	nr	1.0 (n=3)	1.2 (n=1)	nr
Headache on more than 15 days per month including medication overuse headache	57 (n=1)	1.7 (n=2)	nr	4.0 (n=1)	nr	3.3 (n=3)	1.7 (n=1)	2.1 (n=3)
Mixed Migraine and Tension headache	6.4 (n=1)	nr	2.4	nr	nr	nr	nr	nr

Mean 1-year prevalences (%) in adults aged 18 – 65 year of all headache, migraine, tension-type headache and Medication-overuse headache from population-based studies by WHO region

n = Number of studies in the WHO region contributing to the reported mean.

nr= Not reported. This is indicative of lack of relevant studies rather than absence of the disorder.

The discrepancy between 80 % for tension-type headache and 56.1 % for all headache arises because these are means of estimates from different studies. Those focusing on the former generally made greater effort to include infrequent tension-type headache (by definition occurring less than once a month), which is commonly unreported, those considering all headache might overlook this.

Epidemiology of headache in Arab countries. Hani T. S Benamer•Dirk Deleu•Donald Grosset.J Headache Pain (2010) 11:1–3. DOI 10.1007/s10194-009-0173-8

Discussion:

Headache is a common cause for referral. (6, 7, 8, 9, 10, 11) In the USA 4% of population (14 million) suffer from chronic daily headache which includes many patients with new daily persistent headache. 36 million persons in the USA alone suffer from migraine; 27 million are women (18% of migraineurs are women and 6 % men). 10-14% of women suffer from menstrual migraine. (23) Headache patients, therefore are more often women, we found a frequency of 60.4% in Libyan women in preference to men (39.6%). We found that most patients presented at the relatively young ages of 21-45 years, suggesting that in our community it affects people at defining points in their career prospects and educational progress. In keeping with other Arab countries (22, 23) more of these were young women (62%) than young men (38%). A smaller peak occurred at 40-45 probably accounted for by hormonal disturbance, mainly in women at this age(Table.1).

Stress was a definite headache trigger in 17.8% patients, but 91.6% patients were reportedly under stress.

Family history was positive in 38.1%. With regard to the clinical type of headache presentation we found new daily persistent headache in 33% and chronic daily headache in 57%. Acute recent headache not fitting with either occurred in 9%. The results suggest an equal clinical importance in our community for both clinical entities Figure 1A.

In the current study primary headache occurred in 41.1% of the patients and secondary headache in 28.2%, both types occurring together in 30.7%.

The most important primary headaches were migraine 47% followed by tension headache 20.8%. Migraine without aura occurred in 18.8%, migraine with aura 16.3%, and genetic migraine 11.9%. Tension headache occurred alone in 20.8%, while tension headache occurred in combination with migraine in 6.4% patients. Figure 1B.

The causes of secondary headache are important to recognize and differentiate from those of primary headaches which they may mimic.

The most important causes of secondary headache we found were: sinusitis 9.4%, cervicogenic headache 8.9%, followed by benign intracranial hypertension/cerebral sinus thrombosis 6.4%. Figure 1C.

Benign intracranial hypertension (idiopathic intracranial hypertension) has been found an important secondary headache cause in Libya by others, with a higher incidence than other countries. (21, 22) Facial pain in our cohort was rare (2.5%); trigeminal neuralgia 2%, and glossopharyngeal neuralgia 0.5%.

Analgesia excess headache analyzed separately, was present in 27.7% of the patients, and was most commonly associated with tension headache and migraine Figure 2.

The results for all the cohort headache patients were compared with the worldwide published data. (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 19, 20, 21, 22) Table 3 summarizes the comparison. We had a similar rate for all headache to Africa.

The relationship of headache particularly migraine to epilepsy in Benghazi Libya was further analyzed in our study. Figure 4

Migraine and epilepsy are both common disorders. Migraine affects about 12%-20% of the general population, with 2% suffering from chronic migraine. (7, 24, 25, 19, 20, 22) The lifetime prevalence of epilepsy may be as high as 4%, with the adult population having a prevalence of about 1%. (16) It appears that there is no gender predominance in epilepsy, whereas in migraine, females are more affected than males, in some populations and communities. (26)

The question of whether or not epilepsy and migraine are related is an age old neurological debate. It is now recognised that they share many pathophysiological and symptomatological manifestations and

that the two conditions often coexist in the same patient. (26, 27) Epilepsy was found to occur in patients with migraine and was first described in 1898. (27, 28, 29) Migraine aura and headaches may act as a trigger for epileptic seizures. Epilepsy is not infrequently accompanied by preictal, ictal, and postictal headaches that often have migrainous features. (26) Fugue attacks have been described mainly anecdotally in migraineurs, and most of the literature regarding fugues, pertains to forms of epilepsy with altered awareness, with rare case-reports of fugues associated with migraine alone. (30)

One of our patients presented after an episode of migraine with four days of slightly altered awareness. She also described a past attack which appeared similar to a fugue episode. Her episodes of classical migraine occurred twice per month and were associated with altered awareness. She had a strong family history in female members of her family of both migraine and epilepsy. She also had a positive family history of arterial hypertension, stroke, and diabetes mellitus in first degree relatives.

She suffered from psychological stress induced by the war in Libya and anaemia. She had a good response to low dose anticonvulsant therapy. Fugue attacks in association with migraine have also been reported by others, but are rare. (30)

The incidence and prevalence of epilepsy vary worldwide, but in the Western world, there is an annual incidence of about 0.05%. Prevalence ranges from 0.4% to 1% at any given time, but lifetime prevalence, is substantially higher. [31, 32, 33] Patients with epilepsy have an approximately twofold increased risk of having migraine. [34] Children with migraine were found to have a threefold to fourfold increase in the risk of developing epilepsy. (16) Comorbidity with epilepsy is easier to establish for migraine with aura than for migraine without aura. (35)

Patients with migraine have a heightened risk of epilepsy. (2, 14, 26, 35) We found in this study 27.7% patients with migraine also had epilepsy; this is only slightly higher than the 24% migraine frequency documented by others in patients with epilepsy. (27, 29) Two faces of the same coin?

The lateralized weakness of hemiplegic migraine can overlap symptomatically with a Todd's paralysis that is sometimes seen following an epileptic seizure. [13, 26, 36] EEG findings of slowing in the hemisphere contralateral to the side of weakness are noted both in Todd's paralysis and hemiplegic migraine. [2, 37, 38] In this study 16.3% patients who presented with headache were found to have epilepsy of whom 11% patients with known epilepsy complained of headache and 5% presented with headache only, and were later found to have epilepsy as the main cause of their headache. 42% of the headache and epilepsy patients had secondary causes of headache. A positive family history of migraine was present in 4% (8), and 5%

(10) had clinical phenotypes suggestive of genetic migraine. Figure.4.

Both migraine and epilepsy share genetic links which are most evident in the familial hemiplegic migraine syndromes and they both may respond to the same drugs indicating an association between both conditions.(8,10,12,26) In the Epilepsy Phenome/Genome Project patients with epilepsy who had two or more first-degree relatives with epilepsy had an approximately twofold increase in the risk of having migraine with aura.

The main gene mutations associated with both migraine and epilepsy are mutations of the sodium channel genes, Notch gene, familial hemiplegic migraine genes and the mitochondrial genes.

(2, 8, 10, 12, 15, 16, 17, 26, 39)

In summary we found that 16.3% (33) of the patients who presented to us with headache had epilepsy, 11% (22) were known to have epilepsy and 5% (11) presented with headache only, and were later found to have epilepsy as the main cause of their headache. Migraine was associated with epilepsy in 27.7%.

Review of the available literature suggested to us that although we do have a representation of the associated conditions we do not have a higher than expected percentage and certainly do not significantly exceed the reported statistics of others. (26, 27, 31, 32, 33, 34, 35) This may suggest that when tested we may find that the incidence and prevalence of gene mutations relating to epilepsy and migraine in our community is not high/ or higher than in others, but this requires further studies including genetic testing.

How common is genetic migraine? By this we mean migraine that has occurred due to known migraine causative genetic defect. Hemiplegic migraine can be sporadic or familial, in which case the headache and the other features are similar to those of the classical migraine type but it includes various degrees of a fully reversible motor weakness, visual, sensory and/ or language symptoms. Familial hemiplegic migraine (FHM) is defined as hemiplegic migraine with at least one first- or second degree relative with migraine with aura including motor weakness. In children sensory dysfunction is more common. It is further subdivided into FHM1, FHM2, FHM3, according to the causative gene mutation. Different mutations may lead to hemiplegic migraine alone, hemiplegic migraine with complex partial seizure and/ or secondary generalization, and / or ataxia with cerebellar atrophy. (2, 26, 40)

We found a presumptive frequency in our headache patients of 11.9% in whom a highly suggestive genetic association was available. Firm data regarding a genetic headache were not available in 34.7% of individuals. A clearly absent link was noted in 53.5%.

Familial Hemiplegic Migraine type 1 (FHM1) occurred in 4.5% (9) and appeared to be the most frequent clinical phenotype, Figure.3. In Denmark, 1: 10,000 population suffered from FHM, females were more likely to be affected than males.(41)

The genetic component is higher in migraine with aura than with migraine without aura, but genetics are involved in other headaches as well such as tension-type headache and cluster headache, gene discoveries in these headache types, unlike in migraine, are essentially lacking.(16)

With regard to possible headache triggers the following were studied: stress, arterial hypertension and other comorbidities, smoking, social status and lack of sleep. In

regard to arterial hypertension concurrent with most studies (42, 43,44,45,46) we found that arterial hypertension alone was unlikely in adults to present with headache alone as a presenting feature, however it gained importance when combined with stress. (24,47) Migraine, tension headache and hypertension are common disorders. (45, 46, 48) Migraine and hypertension affecting 10-22% of the general adult population, so about 3% of the population may have both.(45)

Arterial hypertension was the most common comorbidity in our patients in 27.7% and 45.7% had no comorbidities. It was the underlying cause of headache in 5% of our headache patients as a first presentation of their hypertension. Hypertensive patients were more likely to have tension type migraine (38%) or chronic daily headache (64%) and to be women (59%).

In general smoking correlated with increased headache frequency as well as stress, in accordance with the findings of others. (49) Stress was nearly a universal risk factor with 93% of pts complaining of it, stress was also reported as a specific headache trigger in 17.8% of patients and it was the commonest trigger among the studied population.

The other factors that may have attributed to increased headache frequency included:

1-lack of patient awareness for the need of prophylaxis in 68.3% of patients, this applied to both uneducated patients along with a large sector of educated patients, only 27.2 % had received prophylactic therapy in contrast to 70.3% who were given analgesia alone. Figure.5.

2-The under prescription of prophylaxis by the general practitioners and hospital emergency doctors which was evident in the fact that prophylaxis was prescribed to only 7.4% of patients managed by General practitioners. Hospital doctors appeared to provide less prophylactic therapy as only 1.5% was prescribed by them despite most patients presenting to them first.

In contrast Specialist Neurologists prescribed to 22% patients who received prophylaxis, an their patients were aware of the need for it. Further highlighting the need to educate both the public and general practitioners and other specialists regarding headaches and their management as not all patients will be immediately referred to neurologists. This would lessen the burden of analgesia excess headaches.(50)

The relationship of chronic headaches and new daily per-

sistent headache with overuse of analgesic medications has been widely established. (8, 10,11, 25, 50) It is well recognised that migraine patients are more susceptible to analgesia excess headache, the same may be true for patients with cluster headache and tension-type headache. (11,25,50) We had one patient with phosphodiesterase induced headache further highlighting the neurological complications of this group of medications (4, 51) which are currently freely available over the counter.

A number of drugs have been utilized in prophylaxis and specific management of headache, including B-blockers, tricyclic antidepressants, and anticonvulsant drugs.(6,7,8,9,10,52,53); the latter are especially effective in patients who also have epilepsy.(27) The use of specific treatments tailored to the specific headache type and patient, as well as patient and physician education would lessen the economical and social burden of headaches in the community. It would also specifically lessen the frequency of analgesia excess headache and over the counter misuse of drugs. (6,7,8,9,10,27,52,53)

With regard to investigating headaches:

The debate continues as to whether all patients should have head imaging performed when presenting with a complaint of headache. Headache is a common symptom which is usually of minor significance and clears up spontaneously. Rarely headaches represent a warning sign of an underlying pathology.(45) In these situations brain imaging is mandatory to pick up underlying pathology.

In our study the results for brain scanning were as follows: out of 202 patients 37.6% (76) had had no imaging. Those who underwent scans 62.3 % (126) were divided into 47% (95) MRI, and 15.3% (31) CT.

39% of the scans were requested by neurologists while 61% had been requested by Emergency room internists and general practitioners. This may reflect an open policy for scanning in our medical establishments. Our results are compatible with international results. (54, 55)

An open policy for head imaging should be encouraged, using practice guidelines

and audit more widely and updating them according to each centre experience and results.

(8, 10, 54, 55, 56,57,58,59,60,61,62,63,64,65)

Lumbar puncture even where indicated was infrequently performed in all the headache patients studied.

Junior staff albeit trained to take histories in headache patients formed saw 72.7% of the cases in our cohorts of patients. The emergency room was the site of first contact for 50% of the patients.

We identified the following limitations in our study:

The study was conducted only in the locations mentioned ie BMC Emergency and Medical departments, and the University Specialist Neurology Clinic a consultancy

private clinic and 7th October Hospital Neurology Clinic.

We followed up our patients for less than one year in almost all cases

The fact the country was at war at the time of the study may have confounded some factors such as stress and epilepsy associations.

We had no access to genetic testing to confirm clinical phenotypes but aim to provide this in future studies

Conclusions and Recommendations:

Headache is an important cause for neurological referral. Protocols to define the exact diagnosis, best investigation and treatment plans should be distributed amongst practitioners,

medical students and newly graduated doctors. An open protocol for investigation (especially brain imaging by MRI and CT scan) should be encouraged with easy access for a specialist opinion. Junior medical staff should be trained and educated in performing lumbar puncture safely when indicated for CSF analysis as

well as patient counselling to obtain consent and interpretation of the results. Educating the public

and patients will help to reduce medication related headaches and encourage earlier referral for specialist management of both primary and secondary headaches. Specialist headache clinics and

headache specialist neurologists and specialist nurses may add to improving patient care. Guidelines should be set and regularly updated.

Epilepsy and genetic mutations are emerging as important risk factors. The association with genetic types of headache and epilepsy should not be ignored and requires the establishment of laboratories with facilities to provide clinical information at an earlier and more

economically expedient level than currently available. Arterial hypertension and stress are important co-morbidities and triggers of headaches

especially when combined. Co-morbidities and triggers should be managed effectively in the community to avoid morbidity including analgesia overuse complications.

Educating students, medical and paramedical staff into the various aspects of the

pathophysiology and management of headaches and facial pains can have huge

economical and health-related beneficial impact. Diagnostic guides may be helpful if distributed to junior staff.

Further research in the epidemiology of headache in the developing world may guide scientists and service providers to improve care for headache sufferers in this part of the world.

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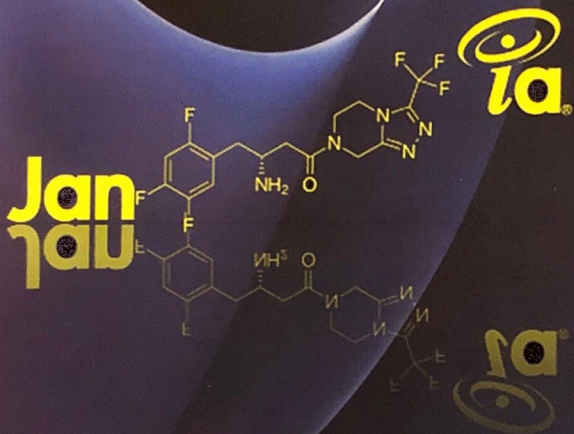
Fibrodysplasia ossificans progressiva, "Stone Man Syndrome"

Fibrodysplasia ossificans progressiva (FOP) is a progressive genetic disorder that turns soft tissues into bone over time. The ACVR1 gene found in bone, muscles, tendons, and ligaments regulates growth and development of those tissues, and is normally responsible for turning cartilage into bone as children develop. However, mutations of this gene can allow ossification to go unchecked throughout a sufferer's life, even turning skeletal muscle into bone and causing joints to fuse together. This disorder occurs in about 1 in 2 million people, and there are currently no treatments or cures. Trauma exacerbates the condition, so attempts to remove bone surgically just results in the body producing even more bone in the area.

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MedicoImages





What's in a name?

E CELEBRATING OVER 12 YEARS,
E JAUNUVIA WORKS WHEN BLOOD SUGAR IS HIGH
E AND WORKS LESS WHEN BLOOD SUGAR IS LOW
E WITH OVER 89 MILLION PRESCRIPTIONS WRITTEN,

Therapeutic indications

For adult patients with type 2 diabetes mellitus, Januvia is indicated to improve glycaemic control:

as monotherapy

- *in patients inadequately controlled by diet and exercise alone and for whom metformin is inappropriate due to contraindications or intolerance.*

as dual oral therapy in combination with

- *metformin when diet and exercise plus metformin alone do not provide adequate glycaemic control.*
- *a sulphonylurea when diet and exercise plus maximal tolerated dose of a sulphonylurea alone do not provide adequate glycaemic control and when metformin is inappropriate due to contraindications or intolerance.*
- *peroxisome proliferator-activated receptor gamma (PPAR γ) agonist (i.e. a thiazolidinedi*

one) when use of a PPAR γ agonist is appropriate and when diet and exercise plus the PPAR γ agonist alone do not provide adequate glycaemic control.

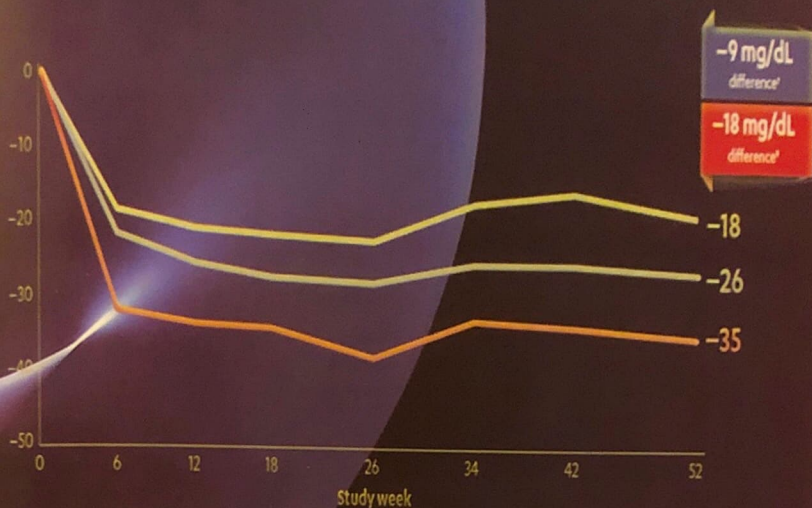
as triple oral therapy in combination with

- *a sulphonylurea and metformin when diet and exercise plus dual therapy with these medicinal products do not provide adequate glycaemic control.*
- *a PPAR γ agonist and metformin when use of a PPAR γ agonist is appropriate and when diet and exercise plus dual therapy with these medicinal products do not provide adequate glycaemic control.*

Januvia is also indicated as add-on to insulin (with or without metformin) when diet and exercise plus stable dose of insulin do not provide adequate gly-



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*95% CI: -13, -4; $P < 0.001$. *95% CI: -22, -13; $P < 0.001$.

Januvia
(sitagliptin)
25 mg, 50 mg, 100 mg tablets