

# Women with Migraine Having High Risk of Hypertension, Heart Disease and Stroke : A Quick Survey

P Chandra

Department of Research - Ph D Computer science  
Tirupur Kumaran College for Women  
Tirupur, India  
chandragunasekar@gmail.com

Dr. V Arulmozhi

Associate Professor,  
Department of Research - Ph D Computer science  
Tirupur Kumaran College for Women, Tirupur, India  
drarultkc@gmail.com

**Abstract** - Biomedical informatics is a field which mainly concentrates on the effective usage of medical data often provided by the use of technology and people to improve individual health. Currently headache is a significant trouble among human with regard to several causes. Tension, stress, Obesity and medication overuse are the main reasons for the occurrence of headache. The objective of this study is to conduct a systematic review of the effects of biomedical informatics applications with related to headaches. A data frame with 4152 observations on 133 subjects for 9 variables is taken for the study and from this a subset of data on migraine treatments collected by Tammy Kostecki-Dillon consist of headache entries kept in a treatment program. Patients entered the program at different times over a period of about 3 years. It is observed that women are having the high risk of occurrence migraines. This leads to higher degree of occurrence of hypertension and cardiovascular disorder in women than in men.

**Keywords**- Migraines, TTH, Aura, Cluster headache

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## I. INTRODUCTION

Biomedical Informatics is the technological field used for accumulating, recovering, distributing and optimally using the biomedical data and knowledge for problem solving and decision making. Headache is defined as a pain happen from the head or upper neck of the body. The pain begins from the tissues and construction that bound the skull or the brain. The slim cover of tissue (periosteum) that encircle the bones, muscles that encase skull, sinuses, eyes and ears, as well as the thin tissues that wrap the surface of the brain and spine (meninges), arteries, veins, and nerves, all can become irritated and cause headache. The hurt may be a dull ache, sharp, agonizing, constant, intermittent, mild, or intense [1].

Based upon the starting place of pain there are three categories of headache. They are Primary headaches, Secondary headaches and cranial neuralgias, facial pain, and other headaches. Migraine, tension, cluster and other less common type headaches are of primary headaches. Tension type headache occurs most common on men and women. According to World Health Organization 1 in 20 people in the developed world suffer from tension headache. The second most common primary headache is Migraine, which affects men and women but women are affected badly. The third and rare type of headache is Cluster headache, affects men in their late 20s though women and children are also suffer in this type of headache.

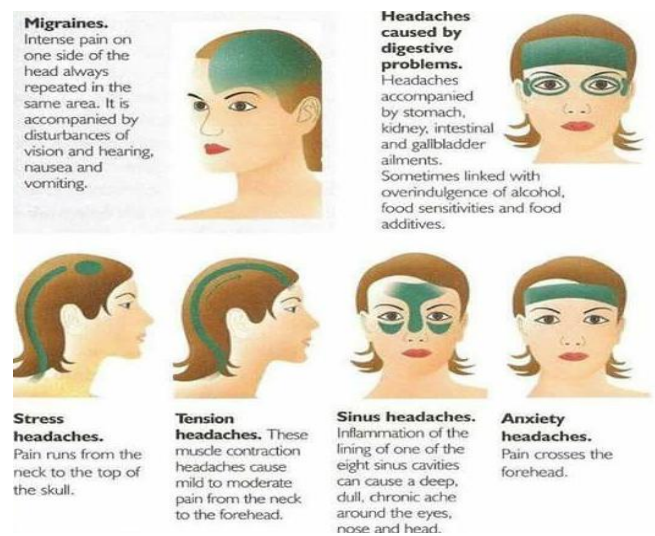


Figure1. Headache Types

Secondary headaches are will occur due to an essential constructive problem in the head or neck. This is a very extensive group of medical conditions ranging from infected teeth or pain from an infected sinus, to severe conditions like bleeding in the brain or infections like encephalitis or meningitis. Traumatic and Medication overuse headaches are fall in this category.

Cranial neuralgia is the irritation of one of the 12 cranial nerves coming from the brain that control the muscles and carry sensory signals to and from the head and neck. Trigeminal neuralgia, which affects cranial nerve V

(trigeminal nerve), the sensory nerve that supplies the face and can cause intense facial pain when irritated or inflamed.

Depends upon the category there are 17 types of headaches occurs in human.

TABLE I. HEADACHE TYPES

Sno	Headache	Type
1	Episodic tension headache	Primary type
2	Chronic tension headache	
3	Muscle contraction headache	
4	Migraine with aura	
5	Migraine without aura	
6	Cluster headache	
7	Paroxysmal hemicranias (Cluster)	
8	Cough headache	
9	Stabbing headache	
10	Headache associated with sexual intercourse	
11	Thunderclap	
12	Hypnic headache	
13	hemicranias continua	
14	New daily-persistent headache (Chronic)	
15	Headache from exertion	
16	Trauma, Disorders, Infection, Structural problems in face bones, teeth, eyes, ears, nose, sinuses and other structures, Substance abuse	Secondary type
17	Trigeminal neuralgia	Cranial neuralgia type

## II. LITERATURE REVIEW

Epigrammatic intercession (BI) is an effectual handling in primary care with lasting effect 6 months after the intrusion for Medication Overuse Headache [2].

Traditional pharmacological therapy with the encouragement to use biofeedback added to it in the treatment of MOH is an effective approach for reducing the frequency of analgesic intake [3].

There are improvements after the withdrawal of medication over use for chronic headache and the improvements lasts at least nine years, with a parallel increase in the use of disability benefits [4].

Awareness of clinical presentation and variety healing options for patients with Medication overuse headache. MOH is preventable and treatable [5].

Migraine is co morbid with obesity. The occurrence of both episodic and chronic migraine is increased in individuals those who are obese. The risk of migraine is high in those with increased obesity status. The effect is very high in reproductive age [6].

Too much of caffeine consumption causes a progression of both acute and chronic biological and physiological changes that may give rise to cognitive decline, depression, fatigue, insomnia, cardiovascular changes, and headache [7].

There are proofs available that adding of acupuncture to indicative treatment of attacks reduces the frequency of headaches. Acupuncture may be at least similarly effective as treatment with prophylactic drugs [8].

At the time of withdrawal of Medication overuse and in order to reduce headache days, it is useful to take either celecoxib or prednisone as a bridge. There is no difference between these two. [9].

The happening of chronic daily headache among first-visit headache patients was 15.2%, with Medication overuse occurring in 5% of the patients when using ICHD-3  $\beta$  in a multicenter study in Korea. The Chronic Migraine treatment tells the advanced strategies in improving CDH and MOH. [10].

MOH risk factor relapse is determined as the occurrence of headache frequency before drug withdrawal, duration of primary headache, and headache frequency after drug withdrawal [11].

The experimental results indicated that the Case based reasoning Clinical decision support system developed and is used to diagnose Probable Migraine and Probable Tension Type Headache with a high degree of accuracy and performed better than the guideline-based CDSS. This system could be used as a diagnostic tool to assist general practitioners in distinguishing PM from PTTH [12].

Headache rate of recurrence was lesser in the investigational condition versus control condition for those with relatively lower opening levels of headache frequency. There is no greater step up in headache cruelty and disability for the experimental condition comparative to the control condition. Motivational interrogation is an approach to progress outcomes for adolescent medication overuse headache [13].

MOH is a treatable and preventable public health problem worldwide. The improvements seen in two of three MOH patients after withdrawal suggest that detoxification is the logical first step in treatment. Preventions as well as treatment should probably be attempted in primary care, leaving the more complicated cases to neurologists. The gain from treating patients with MOH is potentially high, and may lead to substantial economic savings for society as well as for individual patients [14].

Merely advice alone is not an enough treatment for Medication overuse. Inpatient withdrawal is significantly more effective. An outpatient strategy will be helpful for complicated MOH patients [15].

There is an evident improvement, if patients have some health related quality of life aspect particularly in the social activity domain. The results clearly says that continuous care has a positive crash on patients' health status and functioning, also for patients already on anti migraine therapy, and that the use of patient oriented outcome measures is a viable way to capture such improvements [16].

The initial type of interference did not influence the outcome at 4year follow up. The long term diagnosis is relatively favorable as there was a continuing decline in headache, one third of the MOH patients having  $\geq 50\%$  diminution in headache frequency from the beginning, and two thirds being without medication overuse. However, the fact that the total burden of headache was still high after 4 years in this group calls for large and scientifically well designed intervention studies with long term follow-up to obtain better treatment regimes for these patients [17].

An analysis confirm that the fixed combination of ASA (250 mg), paracetamol (200 mg), and caffeine (50 mg) is effectual and well tolerated in a broad spectrum from mild to severe migraine and tension-type headache severity independently of the headache diagnosis [18].

The Apriori algorithm proves effective in helping traditional Chinese doctors decide what to prescribe when facing various patients with headache. There are some improvements of Apriori algorithm for ARM to boom its effectiveness is also presented [19].

Stress power is associated with the frequency of occurrence of headache. [20].

TTH Migraine patients had a considerably lesser age at headache onset and frequency, higher mean visual analogue scale (VAS) and greater maximum duration of headache episodes compared to TTH patients. TTH Migraine patients did not differ from (TTH) patients in quality of headache, laterality of pain, way of headache installation and progression

and temporal pattern of headaches. The actual migraine symptoms were more frequent. Stresses, both physical and psychological, were particularly common in both patient groups [21].

Menstrual migraine referred as hormonal migraine is the most common type of migraine without aura. Hemiplegic migraine and basilar migraine are the example of migraine with aura. Retinal migraine referred as ocular migraine is another migraine type with migraine symptoms which include charges in vision and blurred vision. Infants, children and teenagers often suffer from abdominal migraine which is characterized by stomach pain, nausea, and vomiting [22].

The amplitude of resting state fMIR activity fluctuation is higher in migraine with aura than in migraine without aura. It is also found that cortical hyper excitability will occur in migraine with aura [23].

An incomplete circle of Willis is more common in migraine with aura subjects than controls, and is associated with alterations in cerebral blood flow [24].

Stresses, both physical and psychological, were particularly common in patient groups [25]. Many people continue to have migraine attacks in older age. Special concentration should be paid to the finding of new migraine-like symptoms, especially visual migraine symptoms without headache.

Sensitive and defensive medication should be chosen carefully. Effectual treatment is available and, as for all age groups, careful supervision improves the quality of life [26].

Early researches found a "consistent associations" between migraine and cardiovascular disease, which "persisted" after adjustment for traditional cardiovascular risk factors. There is an "urgent need" to understand what's behind the link, so the patients can look at treatments to prevent heart attacks and strokes in women with migraine. It is also suggested that people with migraine should have their overall cardiovascular risk assessed, so they can be advised about any steps they can take to reduce it – for example, reducing blood pressure if it's too high, or stopping smoking if they smoke [27].

### III. MIGRAINE

Migraine is a severe head pain habitually occurred by many naturally disabling symptoms. Nausea, vomiting, difficulty in speaking, numbness or tingling and sensitivity to light and sound are the symptoms of migraine. It tend to run in families and recently some genetic components are identified which creates migraines. It affects people of all ages and often goes undiagnosed in young children. Experts refer to migraine

a neurological disease, while others prefer to call it a neurological condition or disorder. Migraine attacks are classified as primary headaches because pain is not caused by another disorder or disease.

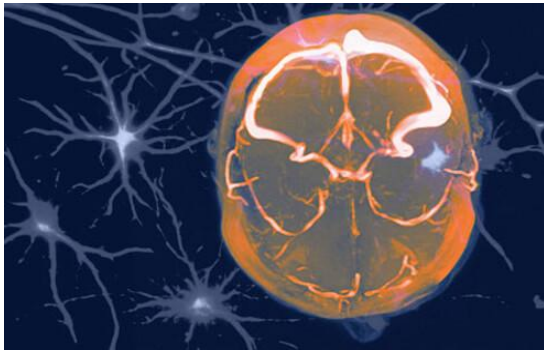


Figure2. Illustration of Migraine

International Headache Society recognized that there are several types of migraines occur. The most common migraine types arise in adults is migraine with aura and migraine without aura.

#### IV. PROBLEM DESCRIPTION

Women diagnosed with migraine were more likely to have high blood pressure, high cholesterol and a family history of heart attacks. [28]. One analysis found that women with migraine actually had an increased risk of heart attack. Women affected with migraines were having 50 percent more likely to develop with cardiovascular disease than women without the severe headaches, [29].

Women who are affected with migraine headaches, particularly migraine without aura, may be at higher risk for hypertension, a new analysis of the Women's Health Study suggests. Studies have found that 9% of increased risk for incident hypertension associated with a history of migraine with aura but a 21% increased risk among those with migraine without aura.



Figure 4. Women affected with Migraine

Migraine affects three times more of women than men. The incidence of stroke in men is twice that of women. Surveys have shown that the risk of ischaemic stroke was increased in women aged 35 to 45 years old who had migraine with or without aura and was exacerbated by oral contraceptive use, smoking and high blood pressure.

It is possible that migraine and obesity can have some common thing like inflammatory mediators and share one or more final pathways. Obesity seems to be related not only to high occurrence and to the degree of migraine attacks, especially some types of migraine but also to the prevalence of the latter [30].

#### V. CONCLUSION

As a result of this study migraine a primary type headache, occurs due to tension, stress, obesity, overuse of medication etc. It is observed that women with migraine are having 50% higher risk of hypertension, cardiovascular disorder and Stroke.

#### REFERENCES

- [1] Benjamin Wedro and Danette C. Taylor, "Headache", Unpublished.
- [2] Kristoffersen ES, Straand J, Vetvik KG, Benth JS, Russell MB, Lundqvist C, "Brief intervention by general practitioners for medication overuse headache, follow-up after 6 months: a pragmatic cluster-randomised controlled trial, *J Neurol.* 2016 Feb;263(2):344-53. doi: 10.1007/s00415-015-7975-1. Epub 2015 Dec 8.
- [3] Rausa M, Palomba D, Cevoli S, Lazzarini L, Sancisi E, Cortelli P, Pierangeli G, "Biofeedback in the prophylactic treatment of

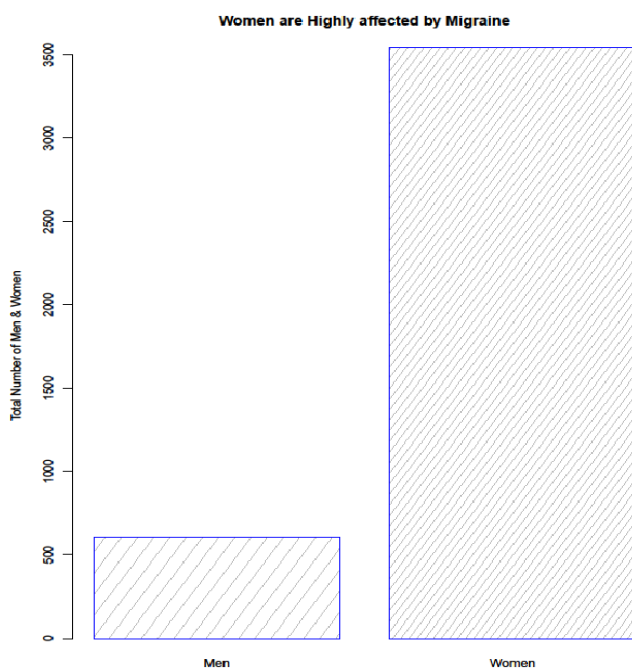


Figure 3. Women are Highly affected by Migraine

- medication overuse headache: a pilot randomized controlled trial”, *J Headache Pain*. 2016 Dec;17(1):87. Epub 2016 Sep 22.
- [4] Magne Geir Bøe, Erik Thortveit, Anita Vatne, Åse Mygland, “Chronic headache with medication overuse: Long-term prognosis after withdrawal therapy”, *October 5, 2016, SAGE Journals*.
- [5] Carlsen LN, Westergaard ML, Munksgaard SB, Bendtsen L, Jensen RH, “Clinical presentation and treatment of medication-overuse headache”, *Ugeskr Laeger*. 2016 Sep 26;178(39). pii: V06160387.
- [6] Lee Peterlin, DO, “Obesity and Headache”, *Headache vol VI May 2016*.
- [7] C A Espinosa Jovel, F E Sobrino Mejía, “Caffine and headache: Specific Remarks”, *Neurologia 2015 Feb 26. Epub 2015 Feb 26*.
- [8] Linde K, Allais G, Brinkhaus B, Fei Y, Mehring M, Vertosick EA, Vickers A, White AR, Acupuncture for the prevention of episodic migraine, *Cochrane Database Syst Rev*. 2016 Jun 28;(6):CD001218. doi: 10.1002/14651858.CD001218.pub3.
- [9] Taghdiri F, Togha M, Razeghi Jahromi S, Paknejad SM, “Celecoxib vs prednisone for the treatment of withdrawal headache in patients with medication overuse headache: a randomized, double-blind clinical trial”, *Headache*. 2015 Jan;55 (1):12835 doi: 10.1111/head.12487.
- [10] MyoungJin Cha, HeuiSoo Moon, JongHee Sohn, ByungSu Kim, TaeJin Song, JaeMoon Kim, Jeong Wook Park, KwangYeol Park, SooKyoung Kim, ByungKun Kim, and SooJin Cho, “Chronic Daily Headache and Medication Overuse Headache in First Visit Headache Patients in Korea: A Multicenter Clinic Based Study”, *J Clin Neurol*. 2016 Jul; 12(3): 316–322. Published online 2016 Jul 1. doi: 10.3988/jcn.2016.12.3.316 PMID: PMC4960216.
- [11] Zhihui Yan, Yuan Chen, Chunfu Chen, Congcong Li, and Xiaojun Diao, “Analysis of risk factors for medication overuse headache relapse: a clinic based study in China”, *BMC Neurol*. 2015; 15: 168. Published online 2015 Sep 17. doi: 10.1186/s1288301504221 PMID: PMC4574711
- [12] Yin Z<sup>1</sup>, Dong Z<sup>2</sup>, Lu X<sup>3</sup>, Yu S<sup>4</sup>, Chen X<sup>5</sup>, Duan H<sup>6</sup>, “A clinical decision support system for the diagnosis of probable migraine and probable tension-type headache based on case-based reasoning”, *J Headache Pain*. 2015 Apr 1;16:29. doi: 10.1186/s10194-015-0512-x.
- [13] Stevens J, Hayes J, Pakalnis A, “A randomized trial of telephone based motivational interviewing for adolescent chronic headache with medication overuse”, *Cephalalgia*. 2014 May;34(6):44654. doi: 10.1177/0333102413515336. Epub 2013 Dec 9.
- [14] Espen Saxhaug Kristoffersen and Christofer Lundqvist, “Medication overuse headache: a review”, *J Pain Res*. 2014; 7: 367–378. Published online 2014 Jun 26. doi: 10.2147/JPR.S46071 PMID: PMC4079825.
- [15] Paolo Rossi, Jessica Veronica Faroni, Cristina Tassorelli, and Giuseppe Nappi, “Advice alone versus structured detoxification programmes for complicated medication overuse headache (MOH): a prospective, randomized, open label trial”, *J Headache Pain*. 2013; 14(1): 10. Published online 2013 Feb 8. doi: 10.1186/112923771410 PMID: PMC3620000.
- [16] Raggi A, Leonardi M, Bussone G, D’Amico D, “A 3 month analysis of disability, quality of life, and disease course in patients with migraine”, *Headache*. 2013 Feb; 53(2):297309. doi: 10.1111/j.15264610.2012.02279.x. Epub 2012 Oct 24.
- [17] Knut Hagen, Claus Albrechtsen, Steinar T. Vilming, Rolf Salvesen, Marit Grønning, Grethe Helde, Gøril Gravidahl, John Anker Zwart, and Lars Jacob Stovner, “A 4 year followup of patients with medication overuse headache previously included in a randomized multicentre study”, *J Headache Pain*. 2011 Jun; 12(3): 315–322. Published online 2011 Jan 5. doi: 10.1007/s1019401002851 PMID: PMC3094644.
- [18] Diener HC<sup>1</sup>, Peil H, Aicher B., “The efficacy and tolerability of a fixed combination of acetylsalicylic acid, paracetamol, and caffeine in patients with severe headache: a post-hoc subgroup analysis from a multicentre, randomized, double-blind, single-dose, placebo-controlled parallel group study”, *Cephalalgia*. 2011 Oct;31(14):1466-76. doi: 10.1177/0333102411419682. Epub 2011 Sep 9.
- [19] Miao Wang, Lei Zhang, Zihao Zhang, Chen Xu, Guobin Chen, Huiliang Shang, Xujun Li, “The application characteristics of traditional Chinese medical science treatment on headache based on data-mining Apriori algorithm”, *Electronic ISBN: 978-1-4799-5669-2 Print on Demand (PoD) ISBN: 978-1-4799-5670-8*
- [20] Schramm SH, Moebus S, Lehmann N, Galli U, Obermann M, Bock E, Yoon MS, Diener HC, Katsarava Z, “The association between stress and headache: A longitudinal population-based study” *Cephalalgia* 2015 Sep;35(10):853-63. doi: 10.1177/0333102414563087. Epub 2014 Dec 5.
- [21] Constantinides V, Anagnostou E, Bougea A, Paraskevas G<sup>1</sup>, Kapaki E, Evdokimidis I, Kararizou E., “Migraine and tension-type headache triggers in a Greek population”, *Print version ISSN 0004-282X Online version ISSN 1678-4227 Arq. Neuro- Psiquiatr. vol.73 no.8 São Paulo Aug. 2015*
- [22] “What is Migraine”, *Magraine.com, Unpublished*.
- [23] Péter Faragó<sup>1</sup>, Bernadett Tuka<sup>1,2</sup>, Eszter Tóth<sup>1</sup>, Nikolett Szabó<sup>1,3</sup>, András Király<sup>1</sup>, Gergő Csete<sup>1</sup>, Délia Szok<sup>1</sup>, János Tajti<sup>1</sup>, Árpád Párdutz<sup>1</sup>, László Vécsei<sup>1,2</sup> and Zsigmond Tamás Kincses, “Interictal brain activity differs in migraine with and without aura: resting state fMRI study”, *Faragó et al. The Journal of Headache and Pain (2017) 18:8 DOI 10.1186/s10194-016-0716-8*.
- [24] Brett Cucchiara<sup>1</sup>, Ronald L. Wolf<sup>2</sup>, Lidia Nagae<sup>3</sup>, Quan Zhang<sup>4</sup>, Scott Kasner<sup>1</sup>, Ritobrato Datta<sup>1</sup>, Geoffrey K. Aguirre<sup>1</sup>, John A. Detre<sup>1</sup>, “Migraine with Aura Is Associated with an Incomplete Circle of Willis: Results of a Prospective Observational Study”, *PLOS ONE | www.plosone.org 7 July 2013 | Volume 8 | Issue 7 | e71007*
- [25] Vasilios Constantinides, Evangelos Anagnostou, Anastasia Bougea, George Paraskevas, Elisavet Kapaki, Ioannis Evdokimidis, Evangelia Kararizou, “Migraine and tension-type headache triggers in a Greek population” DOI: 10.1590/0004-282X20150093.
- [26] “Migraine in latter life”, *The Migraine trust, Unpublished*.
- [27] “Migraines linked to increased heart disease risk in women”, *PubMed Health, Unpublished*.
- [28] “Migraine tied to cardiovascular problems among women”, *Published epaper Deccan Chronicle, Jun 23 2017*
- [29] Byroni Caryn Rabin, “Migraines Tied to Increased Risk of Heart Problems”, *June 2, 2016 1:12 PM*
- [30] Alberto Verrotti, Alessia Di Fonzo, Laura Penta, Sergio Agostinelli, and Pasquale Parisi, “Obesity and Headache/Migraine: The Importance of Weight Reduction through Lifestyle Modifications”, *Copyright © 2014 Alberto Verrotti et al.*