Prevalence of Migraine Headache Among an Optometry Clinic Patient Sample

G.Y. Mousa*
M.E. Woodruff**
M.A. Pierson***

Abstract

The objectives of this investigation were: 1) to determine the prevalence of migraine among patients seen at the Optometry Clinic at the University of Waterloo, 2) to compare the prevalence of migraine in this clinical population to that of other studies, 3) to examine the correlation of migraine with observed ocular conditions and medical problems reported by the subjects.

Abrégé

Cette enquête vise à établir une comparaison de la fréquence de la migraine entre un échantillon des patients à notre clinique d'optométrie et la population générale ainsi qu'établir une corrélation entre la migraine et divers problèmes de santé y inclus les problèmes visuels. La proportion femmes/hommes de migraineux dans notre échantillon est 5:1 et dans la population générale, elle est 50.6:49.4. Evalués contre un groupe contrôle du même age et sexe, les migraineux manifestent une fréquence plus élevée d'arthrite, de tension artérielle et d'allergies. Plus de migraineux manifestent une emmétropie mais la direction de l'astigmatisme était semblable dans les deux groupes. Ces résultats suggèrent une relation entre la migraine et d'autres problèmes médicaux.

Migraine is a vascular headache which affects 10-15% of the population.[1,2] Women constitute 75% of migraineurs. In its classic form, migraine headache may include such visual disturbances as photophobia, scintillating scotoma and hemianopsia.[3] In many patients the headache may be triggered by stress, bright lights, lack of sleep, excessive sleep, oral contraceptives or food containing glutamate or tyramine (cheese, yogurt, nuts, beans and chocolates).[4,5]

*M.S., Ph.D., O.D.
**O.D., Ph.D.
***B.A., M.A., B.Sc.
School of Optometry, University of Waterloo

As a result of the visual components of the headache, many migraine-sufferers consult their optometrist. A diagnosis of migraine headache and provision of patient counselling to avoid triggering factors can be of assistance. In addition, a comprehensive assessment of glare in the patient's environment and the prescription of absorbtive lenses to reduce glare may also alleviate migraine.

Method

The patients involved in this study were drawn from the persons visiting the University of Waterloo Optometry Clinic for oculo-visual assessment. Patients are randomly assigned by the clinic administrative staff to clinic rooms. No alteration was made in this assignment for selection of patients for this study. All the patients involved in this study were seen by one of us (G.Y.M.). The patients in the control group were selected from the patients examined and were matched for sex and age with the patients in the migraine group.

Each patient received a complete oculo-visual assessment, including a comprehensive health-illness history, external and internal ocular health examination, refractive assessment and binocular vision evaluation.

The responses and findings in the patient files provide the data source for this study.

Medication — Oral Contraceptives

Of the 44 female patients in the control group who responded, twelve were on some form of oral contraceptive at the time of the examination and two had taken oral contraceptives in the past. Fifteen of the 44 female respondants in the migraineur group were taking oral contraceptives at the time of the examination and 3 had taken some form of birth control pill in the past.

Refractive Assessment

The control group contained 7 emmetropes, while the migraineur group contained 14 emmetropes. The mean spherical equivalent refractive error of the control group was -1.52D±2.528 S.D. In the

Table 1
Visual Status Summary

Refractive Error	Sample Populations	
	Control	Migraineur
Spherical Equivalents		
— mean	-1.52D	-0.72D
— Standard deviation	2.53D	2.16D
Astigmatism		
— % with-the-rule	59.7%	57.7%
— % against-the-rule	23.9%	30.8%
— % oblique	16.4%	11.5%
Axis: Mean	99.72	44.18°
S.D.	71.62	64.46°

migraineur group the mean spherical equivalent refractive error was -0.72D±2.16D (See Histogram 1). The analysis of astigmatism indicated 59.7% of the control astigmats had with-the-rule astigmatism; 23.9% had against-the-rule astigmatism, and 16.4% had oblique astigmatism. In the migraineur group, 57.7% had with-the-rule astigmatism; 30.8% had against-the-rule astigmatism, and 11.5% had oblique astigmatism. (For a summary of ocular status see Table 1).

Discussion

Troost[3] indicated that migraine affects 10% of the population. Our study revealed that 10.5% of this clinical sample suffers from migraine with a ratio of female to male migraineurs 5:1. A study by Steiner et al[6] demonstrated a ratio of female to male migraineurs of 3.7:1, while Hirayama[7] reports a female to male ratio of 1.9:1.

Migraine headaches have been linked with various systemic and structural disorders, such as cervical vertebrae misalignment, mitral valve prolapse and hyperlipidemia[4]. Migraine has also been associated with allergies[8]. The correlation between migraine and allergies can be explained by the fact that histamine and serotonin which are released during allergic reactions are also involved in vascular headaches[9]. Antiserotonines[10] (methsergide, Sansert) and antihistamines[11] (cyprohepatidine) have been utilized in the treatment of migraines.

This study indicated that migraineurs were allergic to a wide range of allergens. The migraineurs in this study reported reactions to 22 allergens, while the control group reported reactions to 14 allergens. Ten migraineurs suffered from hay fever compared to 5 in the control group (Table 2). Migraineurs demonstrated more multiple allergies than members of the control group.

Table 2
Allergies in the Migraineur and Control Groups

Allergen		Sample Control	Population Migraineur
Airborne:	Dust	2	8
	Smoke	2	1
	Hayfever	5	10
	Mold	1	1
Sub-total		10	20
Animal:	General	4	6
	Wool	0	1
	Feathers	1	0
Sub-total		5	7
Drug:	Penicillin	5	3
	Morphine	0	2
	Codeine	0	1
	Demerol	0	1
	Phenobarbitol	1	0
	Fluress	1	0
Sub-total		7	7
Food:	Orange Juice	0	1
	Caffeine	1	1
	Food Colouring	0	1
	Peanut Butter	0	1
	Sugar	0	1
Sub-total		1	5
Contact:	Formalin	0	1
	Face Medication	0	1
	Silver	0	1
	Poison Ivy	0	1
Sub-total		0	4
Bees		1	0
General		1	1
Asthma		3	4
Totals		28	48

A family history of high blood pressure was significantly more frequent in the migraineurs group than in the control group (Table 3). The factors involved in both migraine and the regulation of blood pressure, such as mechanisms for vasoconstriction, may explain the relationship between these two conditions.

When compared to the control group the migraineurs had a higher prevalence of arthritis. To our knowledge, this is the first time that a relationship between migraine and arthritis has been indicated. This raises the question of the existence of a common causation.

The data indicates a slightly higher prevalence of migraine headaches in those persons with a thyroid condition or a familial history of thyroid disease.

Table 3
Occurrence of Systemic Disorders in the Migraineur and Control Groups

	High Blood Pressure						Arthritis						Thyroid					
	Total Responses		Family History of Disorder		Patients with Disorder		Total Responses		Family History of Disorder		Patients with Disorder		Total Responses		Family History of Disorder		Patients with Disorder	
Sample Population	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Control	54	100	12	22.2	1	1.9	41	100	6	14.6	2	4.9	44	100	3	6.8	1	2.3
Migraineur	54	100	28	51.9	2	3.7	39	100	12	30.7	6	15.3	41	100	4	9.8	2	4.9

The sample and control groups did not provide sufficient number of responses for any conclusion on a relationship.

Results and Observations
Sample composition

Of the 516 patients examined during the course of the study, 261 (50.6%) were females and 255 (49.4%) were males. Patients presenting with a history of migraine numbered 54 (10.5%). The female to male ratio of the migraineur group was 5:1. The age range of the migraineurs, shown in Table 4, ranged from 10 to 60 years with almost 50% between the ages of 20 to 30.

Systemic Disorders (Tables 2, 3)

In the control group, 1 patient had high blood pressure and 12 others reported a family history of high blood pressure. Two migraineurs had high blood pressure and 28 reported a family history of the disorder.

Arthritis was acknowledged by two patients in the control group and 6 reported a family history of the disorder. Among the migraineurs examined, 6 patients had arthritis and 12 noted a family history of the disorder.

One patient in the control group had a thyroid disorder and three reported a family history of thyroid problems. In the migraineur group, two patients had thyroid disorders and four had a family history of thyroid problems.

In the control group, 20 patients suffered from allergic responses to a range of 14 allergens. Of the fifty respondants in the migraineur group 24 suffered from allergic responses to a range of 22 allergens.

Four of the control group and 5 of the migraineurs had asthma or atopic allergies. Twenty of the migraineurs and 10 of the control group were allergic to air-borne antigens. Ten of the migraineurs and 5 of the control group suffered from hay fever. Allergic responses to animal antigens numbered 7 among the migraineurs and 5 among the control patients. For a detailed summary of allergic responses see Table 3.

TABLE 4 AGE MATCH

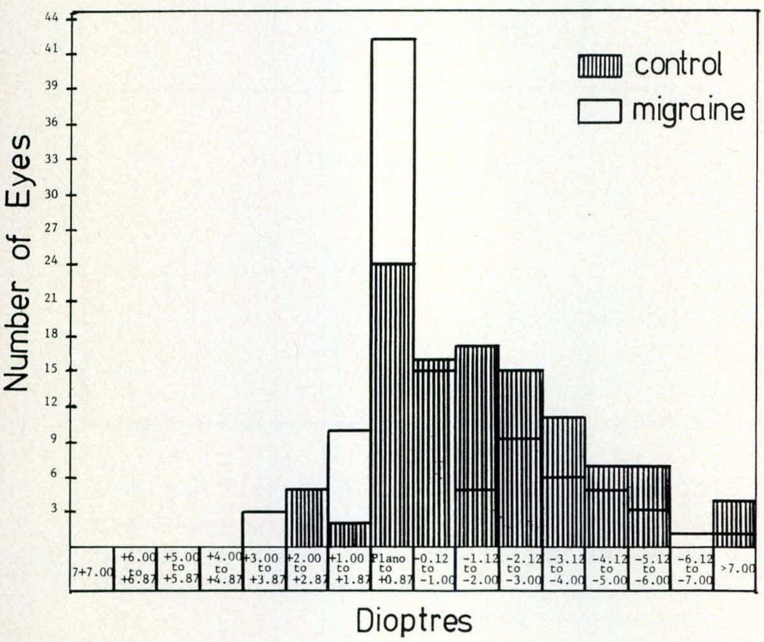
	AGES 10-19	20-29	30-39	40-59	60
CONTROL GROUP	4	39	6	2	3
MIGRAINEUR GROUP	7	26	9	5	5

Oral contraceptives (B.C.P.) have been implicated in triggering migraine headaches. These agents can trigger a stroke, especially if the patient had a family history of high blood pressure and suffers from migraine headaches[5], as did many of the patients in this study. Despite these contraindications for migraineurs, more of the migraineur group (18) were taking BCPs than the control group (14). Most of the migraineurs were either unaware of the adverse effects of the BCP or were not ready to give up the convenience of the BCPs in contraception. They were encouraged to discuss this with their family physician.

There were twice as many emmetropes in the migraineur group as in the control group. The mean refractive error in the migraineur group was -0.72D, while in the control group it was -1.52D. Although the findings imply a lower degree of refractive error amongst migraineurs, this may simply be a reflection of an attempt to seek relief from the visual symptoms which accompany a migraine attack. Even those patients whose attacks do not follow the classical patterns may seek optometric care since a majority of the public associate headache with visual problems.

The data confirm previous studies that approximately 10% of the patients presenting for vision assessment suffer from migraines. The data suggest a correlation exists between migraine and allergies, arthritis and familial high blood pressure. While the data are insufficient to establish a correlation between migraine and thyroid disorder such a relationship cannot be ruled out. Vision care practitioners thus should look for the presence of these disorders when patients present with a history or symptoms of migraine.

Histogram 1: Dist'n of Refractive Error (S.E.)



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