Prevalence of Binocular and Accommodative Dysfunction At The Michigan College of Optometry and Eaton Rapids PLLC.

By Timothy Troupe

Introduction:

Binocular vision and accommodative dysfunction are two important causes of patient discomfort and complaints. Several studies place the prevalence of strabismus at about 3-5%, Clinical estimates suggest that the prevalence of convergence insfficiiency is about 5%. It is especially frequent among students in high school or college and among people with prepresbyopia This retrospective study was undertaken to compare The Michigan College of Optometry Clinic to a private practice clinic to look at differences in correct diagnosis rates for binocular and accommodative dysfunction. Also, areas of weakness and suggestions for improvement were looked at for each practice.

Methods / Subjects:

A retrospective study was performed by pulling patient files from each respective clinic to obtain a total of 100 patients per clinic that were seen between November 1995 to November 1996. This time frame was chosen to see how each clinic performed in the last year. The patients were limited to ages 10-40 years old at the time of the exam. This age group was chosen to try to avoid developmental problems in the young that might interfere with binocular/ accommodative problems. The study chose 40 years as the cut off to limit the effect of pre-presbyopia on binocular and accommodative function. At The Michigan College of Optometry, patient files were pulled starting with names beginning with the letter S and continuing until 100 files meeting the criteria were found Each patientš in-house identification number was recorded. At Eaton Rapids PLLC, the files were pulled from file cabinets with names starting with the letters A and B. The

date of birth was recorded to help identify each patient. This method of pulling files was used to help assure a random population.

The only exams used were primary care and contact lens exams in which binocular and/ or accommodative testing was done. Low vision, developmental, pathology and follow-up exams were excluded. At The Michigan College of Optometry a wide variety of testing procedures were done by numerous students. Because the testing lacked a consistent core of binocular and accommodative testing, a loose criteria had to be used to decide if the patient had a binocular or accommodative problem. The entering visual acuity, habitual prescription and BVA were examined to determine if signs and symptoms could be explained by a refractive problem.

Patients with reduced stereopsis, strabismus, exophoria of 6 pd or greater at distance or near, 4 pd esophoria at distance or near, failing +1.50/-1.50 diopter flipper accommodative facility, reduced amplitude of accommodation for age, reduced NRA/PRA by plus/minus lens build up, negative lag of accommodation were considered to have an accommodative or binocular vision dysfunction. It must be emphasized that some students performed many such tests while others may have done only one such test (ex. cover test or stereopsis). No attempt was made in this study to try to differentiate the specific diagnosis (ex. CI vs. Accommodative spasm) only that suspicious results indicated some sort of binocular vision or accommodative dysfunction.

Results:

Each patient was put into one of the following two categories: Those with complaints and those without complaints.(See Fig. 1) Each of these categories were

further broken down into patients with true binocular and/ or accommodative problems according to the criteria chosen and those without such problems. Those patients with true binocular/ accommodative problems were further divided into those detected at the clinic and those undetected. Each case where a problem existed was further divided according to whether they were (1) treated(VT, visual hygiene), (2) monitored/ follow-up or (3) not treated.

At Eaton Rapids PLLC the following results were found; 13 (13%) of patients had complaints attributable to binocular vision or accommodative problems. 87 (87%) did not present with such complaints. 11 out of 13 (85%) with complaints had a problem. 2 of 13 (15%) did not have a problem. 10/ 11 (91%) with problems were detected. Of those with problems ; 6/ 11 (55%) were treated, 4/ 11 (36%) were monitored and 1/ 11 (9%) were not treated.

For those patients without complaints; 64/ 87 (74%) were found to not have a problem. 23/87 (26%) had a problem. Of the 23 with problems, 17 were detected (74%), and 6 (26%) were not detected. Of the 23 with problems, 7/23 (30%) were treated, 7/23 (30%) were monitored and 9/23 (39%) were not treated.

At The Michigan College of Optometry; 37 (37%) patients had complaints attributable to binocular or accommodative dysfunction. 63 (63%) did not have complaints. 27/37 (73%) of those with complaints had a problem, 10/ 37 (27%) did not. Of those with problems 20/ 27 (74%) were detected. 7/ 27 (26%) were not detected. Of those with problems, 9/ 27 (33%) were treated, 7/ 27 (26%) were monitored and 11/ 27 (41%) were not treated.

For those patients without complaints, 49/ 63 (78%) were found to not have a problem. 14/ 63 (22%) were found to have a problem. Of these, 3/ 14 (21%) were detected, 11/ 14 (79%) were not detected. Those with no complaints but found to have a problem, were not treated.

Discussion:

When comparing the two clinics some surprising similarities and differences occurred.(See Fig. 2 and 3) At MCO, 37% of patients 10-40 years old had complaints that could be attributed to binocular and/ or accommodative dysfunction, compared to 13% at Eaton Rapids PLLC. This difference is probably more related to case history efforts by the clinicians in the separate clinics. The rather high percentage of complaints at MCO could be due to failure to "pin-down" exactly what a patient means by "blur" or " trouble seeing at near". Usually no mention of frequency of blur was recorded. Transient blur would make one suspicious of a non-refractive etiology, possibly accommodative dysfunction.

When a patient complained of visual problems suggesting a binocular vision problem and data supported a true problem 26% of the time they were undetected at MCO compared to 9% at Eaton Rapids PLLC. One important point must be brought up here, if a diagnosis was not made at the assessment section of the exam form then the condition was considered not detected. Frequently a student clinician at MCO would perform additional tests suggesting they suspected or detected a binocular/ accommodative problem but failed to record such diagnosis. Even the author himself was guilty of this in the course of this study. It should also be pointed out that two of

three clinicians at Eaton Rapids, PLLC are O.D.'s with many years experience and the other is a fourth year student. This increased level of experience and better record keeping would tend to decrease undiagnosed binocular and accommodative cases.

An even bigger difference occurred when the patients appeared to have a binocular vision problem but did not have any complaints. At MCO 79% were undetected compared to 26% at Eaton Rapids. A possible reason could be the emphasis placed on specific tests chosen between clinics. At Eaton Rapids a more comprehensive and standard battery of tests were generally performed, in particular cover test and vergences were performed at each visit. At MCO vergences were usually not done on asymptomatic patients. Typically cover test was the only test done and it was frequently left out.

Another big difference occurred in the treatment of symptomatic patients with binocular/ accommodative problems.(See Fig. 4 and 5) At MCO 41% of these patients were not treated compared to 9% at Eaton Rapids. At Eaton Rapids 55% were treated with VT or visual hygiene suggestions compared to 33% for MCO. Part of the higher rate of non-treatment at MCO can be attributed to a higher rate of non-detection of a problem, " No problem found- no treatment plan".

When it came to the asymptomatic patients with binocular or accommodative problems, none were treated at MCO regardless of whether a problem was detected or not. A possible reason might include differing philosophies," If they don't complain, don't fix it". At Eaton Rapids 30% were treated and 30% were monitored. In most cases those treated were educated on visual hygiene. The emphasis here seemed to be

prevention. No evidence was found on whether patients were compliant or not. In an asymptomatic patient treatment may be suggested or offered but ignored by the patient.

Some important areas of weakness at MCO must be stressed. Many times clinicians failed to follow through with the chief complaint. If a prescription is to be filled out it should make sense with the entering acuity's. Several cases of too large or inappropriate prescription changes were noted. A patient with unaided visual acuity's of 20/ 20 O.U. and distance blur complaints was written a myopic prescription of greater than -1.00 sphere with cylinder. A comparison of BVA visual acuity's vs. entering acuity's would have flagged the clinician that something was wrong. Several cases of too large of a BVA change compared to the habitual prescription were noted.

Another problem that occurred was that the particular clinic tended to guide the testing approach. Commonly contact lens patients had no binocular vision testing done, even cover test was frequently not done. Many times a clinician performed testing indicating their suspicion of a binocular or accommodative problem but they failed to record a diagnosis. In all such cases no treatment was given. Therefore, without a diagnosis no problem was given credit to have been detected.

Another frequent pitfall was failure to record problems that were listed in the past on the Master Problem List. While some conditions were successfully treated (ex. accommodative infacility), many were still present yet never written under diagnosis. A final suggestion, all exams should include at minimum; a cover test, at least one accommodative test and stereopsis, even when the patient is asymptomatic. These three tests take very little time. More testing is recommended especially in symptomatic patients. Remember, state law requires certain minimal testing for every exam.

Bibliography:

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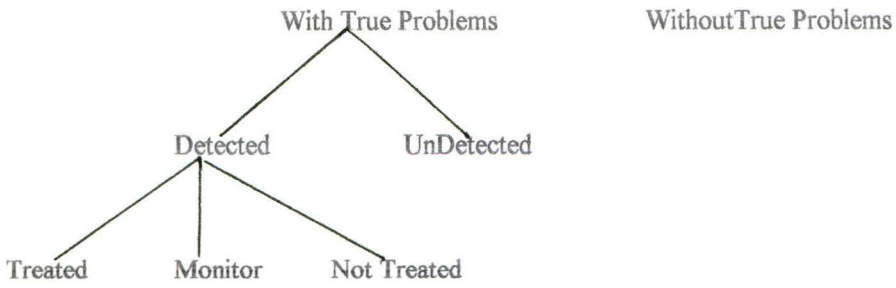
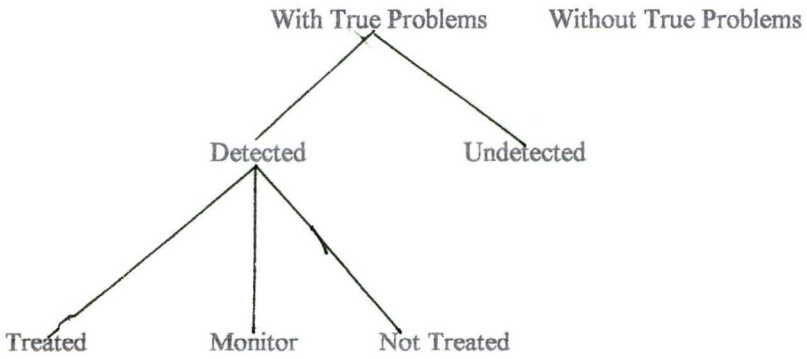
Bennett G.R, Blondin M, & Ruskiewicz J, Incidence and prevalence of selected visual conditions: A review of the literature. American Optometric Association. Journal. 53(8): 647-656, August 1982.

Fig. 1

With Complaints



Without Complaints



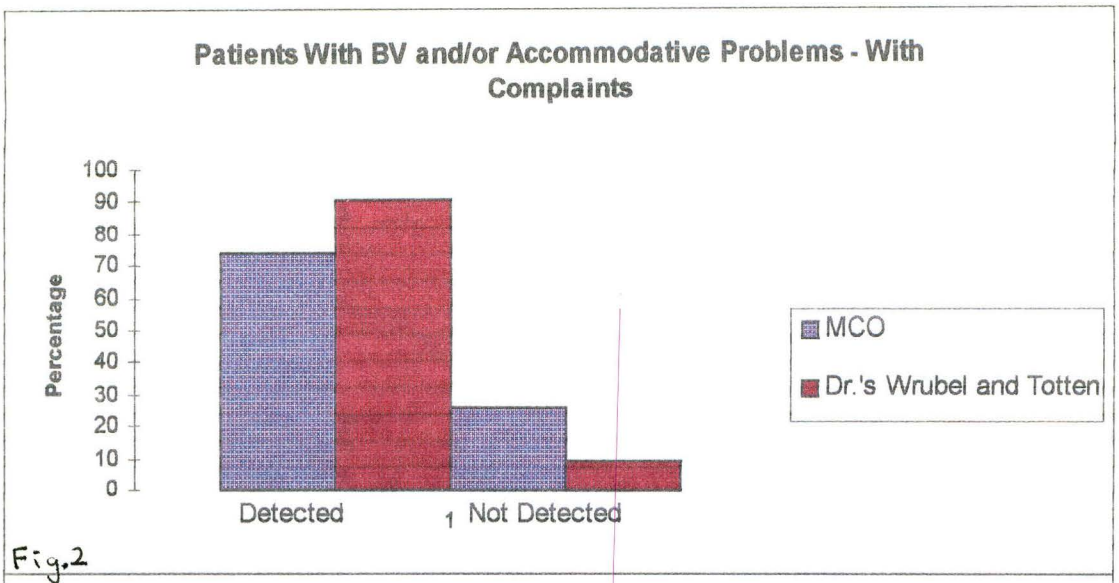

Patients With BV and/or Accommodative Problems - With Complaints
Percentage
100
90
80
70
60
50
40
30
20
10
0
Detected
Not Detected
MCO
Dr.'s Wrubel and Totten

Fig.2

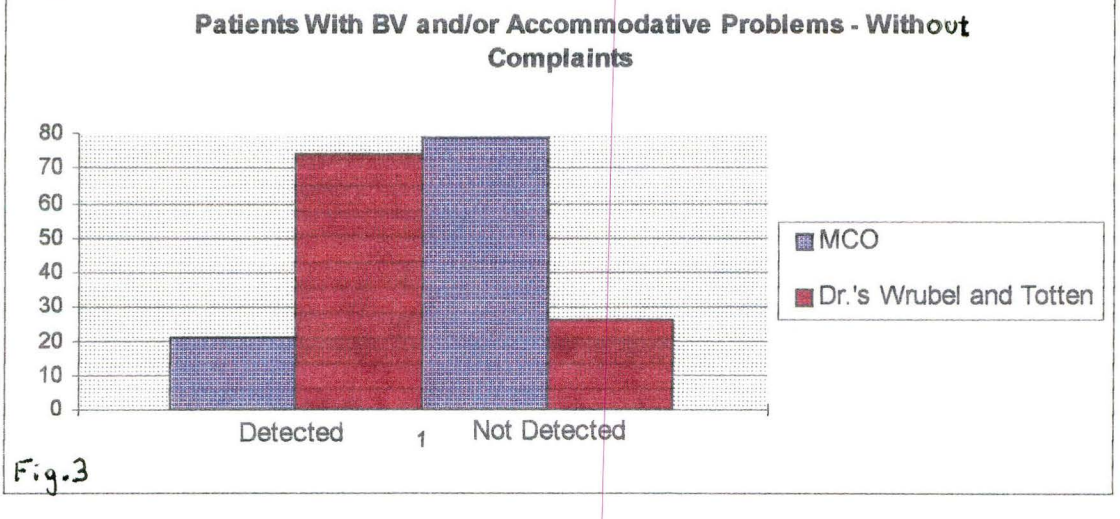

Patients With BV and/or Accommodative Problems - Without Complaints
80
70
60
50
40
30
20
10
0
Detected
Not Detected
MCO
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Fig.3

Management of Patients With BV and/or Accommodative

Problems That Present With Complaints

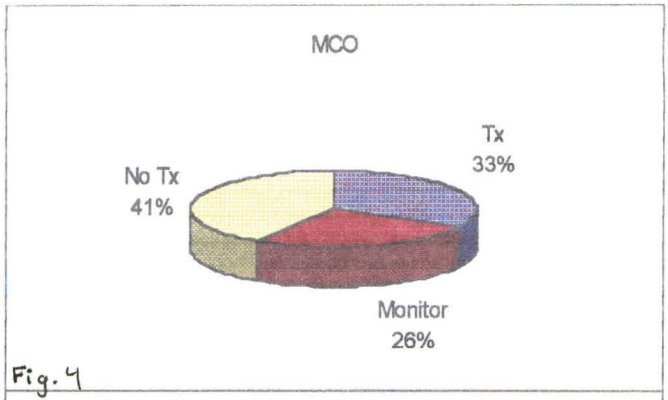

Fig. 4

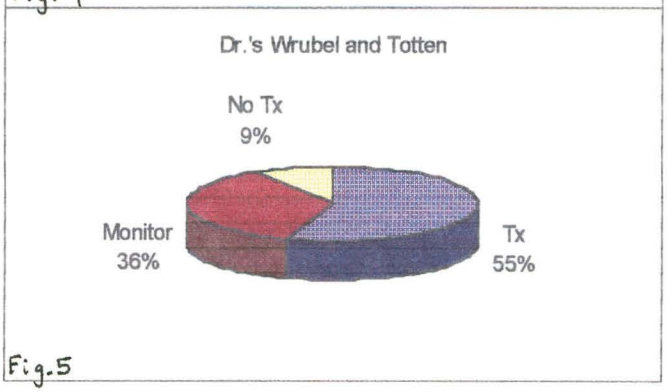

Fig. 5

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	Patients with Complaints	Percentage	Patients Without Complaints	Percentage
Total With Problems	(27/37)	73	(14/63)	27
Problems: Detected	(20/27)	74	(3/14)	21
Problems: Not detected	(7/27)	26	(11/14)	79
No Problems	(10/37)	27	(49/63)	78
Problems: Treatment	(9/27)	33		
Problems: Monitor	(7/27)	26		
Problems: No Treatment	(11/27)	41		

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	Patients with Complaints	Percentage	Patients Without Complaints	Percentage
Total With Problems	(11/13)	85	(23/87)	26
Problems: Detected	(10/11)	91	(17/23)	74
Problems: Not detected	(1/11)	9	(6/23)	26
No Problems	(2/13)	15	(64/87)	74
Problems: Treatment	(6/11)	55	(7/23)	30
Problems: Monitor	(4/11)	36	(7/23)	30
Problems: No Treatment	(1/11)	9	(9/23)	39