
Faculty Perception of Clinical Value of Five Commonly Used Orthopedic Tests

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Purpose: The purpose of this study is to examine the perceptions of the value of five orthopedic tests (straight leg raise, Braggard's test, Kemp's test, Valsalva maneuver, and Patrick's fabere test) in the diagnosis of specific neuromusculoskeletal conditions among the chiropractic faculty at a large chiropractic college. **Methods:** This is an observational study that employed a survey of 41 academic and clinic faculty members with a Doctor of Chiropractic degree. **Results:** Of the 12 posed questions, only five demonstrated statistically significant consistency (positive straight leg raise for the presence of disc pathology, positive Valsalva maneuver for the presence of disc pathology, negative Valsalva maneuver to rule out disc pathology, negative Braggard's test to rule out the presence of disc pathology, and positive Patrick's fabere test for the presence of hip joint pathology). Subgroup analysis demonstrated that the school of graduation may be the only predictor of consistency. **Conclusion:** There were strong indications that faculty members were not consistent in their perception of the value for common orthopedic tests for diagnosing specific conditions. In an evidence-based model of education, there should be a consensus among academic and clinical faculty in order for the students to learn, integrate, and apply in practice what they have learned in the classroom. Active intervention in the academic process is required to accomplish necessary change. (J Chiropr Educ 2011;25(2):164-168)

Key Indexing Terms: Chiropractic; Diagnosis; Evidence-Based Practice; Physical Examination

INTRODUCTION

The goal of evidence-based practice (EBP) is to provide better patient outcomes by merging the patient's needs and desires and the doctor's knowledge and experience with the scientific evidence to develop the most effective treatment plan for the individual patient.¹ In less than 20 years, EBP has become a well established, although not fully integrated, component of health care education^{2,3} and practice.^{4,5}

An evidence-based education is necessary to produce an evidence-based practitioner. Over the past 2 years, Parker College of Chiropractic has instituted an extensive program to incorporate EBP into the curriculum of the college. Evidence-based reviews have been developed by the college covering

a variety of musculoskeletal and nonmusculoskeletal conditions. These reviews are used in academic course work and in the college clinic with the goal of improving patient care and treatment outcomes by using the most current scientific literature. A secondary purpose of the reviews is to provide a common base of knowledge among faculty, thereby improving consistency of instruction. Research classes have been restructured to place additional emphasis on developing skills in searching and evaluating the scientific literature. At the present time, an online course is also being developed by the college to hone these skills in the college faculty.

As this process has developed, several shortcomings in the implementation of EBP have emerged. First among these is the general lack of high-quality studies available for the diagnosis and treatment of many conditions, particularly musculoskeletal conditions. These shortcomings are reflected in the conclusions of a systematic review on the passive straight leg raise test (PSLR), which state, "There

remains no standard PSLR procedure, no consensus of interpretation of results, and little recognition that a negative PSLR test outcome may be of greater diagnostic value than a positive one.⁶ The ease of access to information and widespread dissemination of information have resulted in the loss of the presumed “gold standard status” of many diagnostic tests and treatment interventions.⁷ This has led to the possibility of inconsistency in the perceived value of certain diagnostic tests and treatment interventions between individual faculty members.

Since the most important source of information to chiropractic students is the clinical faculty, not literature searches or peer-reviewed journals, it is important that consistency within the knowledge base of the scientific literature is maintained whenever possible.⁸ The lack of consistency between faculty members has been identified in other disciplines as a factor that inhibits the learning process⁹ and may be a negative factor in the educational process.

Few, if any, studies have been published examining consistency between faculty members, which is necessary for an EBP curriculum and the learning experience. Since diagnosis is the starting point for EBP, the primary purpose of this study is to determine the consistency of the perception of the diagnostic value of specific, commonly used orthopedic tests between faculty members with a Doctor of Chiropractic (DC) degree. A review of the literature relating to the true value of these tests was not performed but will be addressed in later studies. The secondary purpose is to determine whether years teaching, years in practice, or college of graduation affect variation in perception. To the best of the authors’ knowledge this is the first study designed to evaluate the perception of the clinical value of orthopedic testing between the individuals that make up the teaching and clinic faculty of a large chiropractic college.

METHODS

Design

This descriptive observational study employed a survey designed to assess the degree of agreement or disagreement on the diagnostic value of five commonly used orthopedic tests among clinic and academic faculty with DC degrees at a chiropractic college. Sixty-four questionnaires were administered to all academic and clinic faculty members of

the college who were doctors of chiropractic. Questionnaires were submitted by e-mail and were required to be returned within 30 days. The survey, designed by the principal investigator, was comprised of 12 questions asking faculty members their perception of the diagnostic value of five commonly used lumbopelvic orthopedic tests: straight leg raise (SLR), Braggard’s test (BT), Kemp’s test (KT), Valsalva maneuver (VM), and Patrick’s fabere test (PF). Before the design of the survey, an e-mail was sent to all faculty members of the college who currently have or have had a private practice at some point in time, asking them to indicate their 20 most commonly utilized orthopedic tests. The five tests mentioned above were the most frequently named lumbopelvic tests and are consistent with commonly used tests in the clinic of another chiropractic college.¹⁰ The survey asked faculty members to indicate agreement or disagreement on the value of each test to rule in or rule out a specific diagnosis based on a five-point Likert scale. Respondents were also asked to provide the name of the chiropractic college from which they graduated, years of practice and teaching experience, their primary responsibility at the college (clinical or academic), and other demographic factors (eg, age, gender).

Literature searches were performed using the MEDLINE, CINAHL, and MANTIS databases up to August 1, 2010. Searches were limited to the English language and included the MeSH search terms “attitude,” “curriculum,” “medical education,” “faculty,” “learning,” “mentors,” “chiropractic,” and “teaching methods.” Hand searches were also completed. After reading abstracts and titles of several hundred articles, 66 full text articles were ordered, of which 11 were considered germane and utilized in the preparation of this article.

The study was approved by both the Research Committee and Institutional Review Board of the college where it was conducted.

Statistics

Statistical analyses were performed using SPSS for Windows version 16.0 (SPSS Inc., Chicago, IL). The outcome variables were the perception of faculty (response to each question) concerning the value of each of the five specific orthopedic tests in assessing the presence or absence of four conditions, resulting in a “test condition” permutation of 12 (Fig. 1). Faculty members’ perceptions were originally recorded on a five-point Likert scale: strongly disagree, disagree, neutral, agree, and strongly agree. However, for

the purpose of this analysis, because of the small sample, these were collapsed into three levels: disagree (to include both strongly disagree and disagree), neutral, and agree (to include agree and strongly agree). Analyses were performed with college of graduation of faculty members, years of practice (clinical) experience, years of teaching experience, and type of responsibility (clinical versus academic) at the college as separate predictor variables. College of graduation was grouped into two categories: graduates of the college at which the study was conducted versus all others. Years of experience were originally reported as continuous variables but these were categorized into less than or equal to 5 years and greater than 5 years. Thus, all the predictor variables for this analysis were binary categorical. The Pearson chi-squared and the Fisher exact (for asymptotic approximation) tests were used to assess differences in the levels of the response (perception of the use) for each orthopedic test and specific condition. Multinomial logistic regression models (with “disagree” as the referent) were used separately to assess the role of each predictor variable on the faculty’s perception of the value of each test. Results are evaluated at the 5% level of significance.

RESULTS

Demographics

Of the 64 questionnaires submitted, 41 questionnaires were returned, giving a 64.1% response rate. All responses were complete and valid regarding the questions on the use of the orthopedic tests, but 10

were incomplete for the demographic and predictor variables. Among the respondents, 27 (65.9%) were males, 4 (9.8%) were females, and 10 (24.4%) declined to indicate sex. The mean (standard deviation) age, years of clinical experiences, and years of teaching experiences were 47.9 (7.9), 13.2 (7.5), and 6.7 (4.9) years, respectively. Twenty-six (63.4%) were clinical faculty, 12 (29.3%) were academic, and 3 (7.3%) were both. Of the 31 faculty who volunteered information on their college of graduation, 17 (54.8%) were graduates from the college at which the study was conducted and 14 (45.2%) graduated elsewhere. Four (12.5%) had been in clinical practice for 5 years or less and 17 (54.8%) had been teaching for 5 years or less.

Responses

Table 1 shows the distribution of the responses for each test among faculty members. Faculty members significantly agreed that a positive SLR (58.5%, $p = .003$) and positive VM (68.3%, $p < .001$) were strong indicators of the presence of disc pathology and a positive PF (75.6%, $p < .001$) was a strong indicator for hip joint pathology. They disagreed significantly that a negative VM (63.4%, $p < .001$) was a strong indicator that disc pathology was not present and disagreed that a negative BT (53.7%, $p < .014$) was a strong indicator that disc pathology was not present. There was no significant segregation in their perception on the use of the other tests concerning diagnosing the respective conditions. The college from which respondents graduated was a significant predictor of the faculty’s perception only in the use of

- A positive SLR is a strong indicator for the presence of disc pathology.
- A negative SLR is a strong indicator that disc pathology is not present.
- A positive Kemp’s test is a strong indicator for a lateral disc lesion.
- A negative Kemp’s test is a strong indicator that disc pathology is not present.
- A positive Kemp’s test is a strong indicator that facet syndrome is present.
- A negative Kemp’s test is a strong indicator that facet syndrome is not present.
- A positive Valsalva maneuver is a strong indicator for disc pathology.
- A negative Valsalva maneuver is a strong indicator that disc pathology is not present.
- A positive Braggard’s test is a strong indicator that disc pathology is present.
- A negative Braggard’s test is a strong indicator that disc pathology is not present.
- A positive Patrick’s fabere test is a strong indicator for hip joint pathology.
- A negative Patrick’s fabere test is a strong indicator that hip joint pathology is not present.

Figure 1. Survey questions.

Table 1. Distribution of responses (perception) of value of specific orthopedic tests as diagnostic tools for specific conditions by faculty members with DC degree at a chiropractic college

Test Result	Agree n (%)	Neutral n (%)	Disagree n (%)	p Value
+ SLR for presence of disc pathology	24 (58.5)	9 (22.0)	8 (19.5)	.003*
– SLR for absence of disc pathology	13 (31.7)	9 (22.0)	19 (46.3)	.157
+ KT for presence of lateral disc lesion	17 (41.5)	11 (26.8)	13 (31.7)	.505
– KT for absence of lateral disc pathology	11 (26.8)	12 (29.3)	18 (43.9)	.35
+ KT for facet syndrome	11 (26.8)	10 (24.4)	20 (48.8)	.109
– KT for facet syndrome	12 (29.3)	11 (26.8)	18 (43.9)	.350
+ VM for disc pathology	28 (68.3)	5 (12.2)	8 (19.5)	<.001*
– VM for disc pathology	8 (19.5)	7 (17.1)	26 (63.4)	<.001*
+ BT for disc pathology	14 (34.1)	13 (31.7)	14 (34.1)	.976
– BT for disc pathology	7 (17.1)	12 (29.3)	22 (53.7)	.014*
+ PF for hip joint	31 (75.6)	6 (14.6)	4 (9.8)	<.001*
– PF for hip joint	17 (41.5)	11 (26.8)	13 (31.7)	.505

+ = positive; – = negative.

* Significantly consistent perception of faculty members on the value of the orthopedic test.

positive SLR for the presence of disc pathology as well as negative KT for the absence of lateral disc lesion. In general, although it was hard to show significance because of the lack of statistical power, there were very strong indications that faculty members were not consistent in their perception of the value for common orthopedic tests for diagnosing specific conditions.

DISCUSSION

Nyiendo and Haldeman found in their study of 2000 consecutive new patients at a chiropractic college clinic that 30 different methods were used to diagnose lumbosacral strain in patients with a single presenting complaint of low back pain.¹¹ Although the study was published in 1986, the variety of methods utilized may be an indicator of the lack of consensus among the faculty at that time as to the true value of many tests. The present study may indicate that consensus in diagnosis may remain an elusive goal. The results of this study demonstrate a general lack of consistency in the perceived value of several commonly used orthopedic tests. Only 5 of 12 possible items (Table 1) demonstrated statistically significant agreement relating to the perceived value of the test (positive SLR for disc pathology, positive VM for disc pathology, negative VM to rule out disc pathology, positive PF for hip joint pathology, and

negative BT to rule out disc pathology). The reasons for this finding may be multifactorial. One possible explanation may be that the scientific literature relating to the value of many orthopedic tests is limited, inconsistent, and sometimes conflicting. This would likely contribute to these results. A second explanation is that the typical college faculty has a varied background to include teaching experience, practice experience, and college of graduation. Differences in background may reflect as differences of opinion in the value of certain tests.

This study, although underpowered, did demonstrate a weak trend that indicates college of graduation may be an important factor that relates to consistency. The highest degree of agreement between faculty members was among those who were teaching at their alma mater but only on two tests (positive SLR for disc pathology and negative KT for lateral disc pathology). This may be a reflection of the consistency of instruction that they received in their chiropractic education in those areas.

A disturbing note was the trend toward inconsistency between the academic faculty and clinic faculty on several tests. These include negative SLR for disc pathology, positive KT for lateral disc protrusion, negative VM for disc pathology, and positive and negative PF for hip joint pathology. This inconsistency may confuse students when they transition to the clinic setting from the academic setting. It is of value for the faculty

member and the student to know when a test is supported in the scientific literature as well as when it is not. The use of focused joint clinic and academic faculty meetings to discuss the literature relating to these tests may be one method to improve consistency.

Limitations

This study has several limitations. Data were omitted on several of the surveys which may have been considered identifying data by some of the participants. Lack of these data weakened statistical analysis and required deviation from a five-point Likert scale to a three-point scale to arrive at meaningful findings. The study was underpowered, which limited interpretation, particularly when attempting subgroup analysis. The tests selected for this study were drawn from a survey provided by the same group that completed the final survey. This action may have introduced bias into the study. This study was conducted at one chiropractic college and the findings may not generalize to other colleges. Finally, this is an observational study and manifests the shortcomings of that design.

Although the findings of this study are limited by lack of power and design, this study indicates the possibility of inconsistency between faculty members at Parker College of Chiropractic. This may exist at other schools as well.

CONCLUSION

Since the scientific literature is limited on many of these tests, it is certainly possible that inconsistent or inaccurate information can be provided by a faculty member to the student. There is an urgent need for additional sensitivity and specificity studies on commonly used orthopedic tests. In an evidence-based educational and practice paradigm, all practical steps must be taken to maximize consistency based on the scientific literature. Lack of agreement between individual faculty members needs to be addressed and resolved. When that is not possible because of limited or conflicted studies, the faculty member should be aware of those shortcomings and pass that information on to the student when appropriate.

CONFLICTS OF INTEREST

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declare.

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