

Stirrup Setting in Barrel Racers – A Pilot Investigation

INTRODUCTION

In equestrian sports, the alignment of a rider's spine is a significant factor in achieving maximum horse and rider performance in training and competition. Both the rider's ability to establish good balance and to maintain a straight sitting posture help center the rider's weight over the horse's spine, allowing both rider and horse to function more effectively. This phenomenon is well known and documented throughout the equestrian field. What is less well known is effective and lasting ways to correct a poor posture once it has been identified or a simple means of identifying those riders who are most in need of attention. This article addresses one possible way of doing so.

Upper cervical Chiropractors assess rider spinal alignment by measuring what is called frontal plane orientation of the pelvis (hips). In other words, the position of the top of the hips is compared to the horizon and any difference is reported as degrees or millimetres of horizontal tilt. Experience from clinical cases has revealed that with the tilting of the hips, riders see the need to adjust their stirrups unevenly to maintain their balance. This unique way of measuring hips through measuring saddle stirrup setting at the girth strap formed the basis of an on-line pilot investigation. Questions were asked of riders to find out how many Albertan barrel racers may be experiencing mechanical imbalance in their hips and whether or not they are experiencing symptoms of pain and discomfort. The primary goal of this study was to survey barrel racers for the incidence and prevalence of both stirrup settings and spine related symptoms.

Pelvic imbalance and postural distortion can be serious indicators of underlying health concerns¹. By investigating stirrup settings and the presence of symptoms of head and back pain discomfort, the authors were able to determine that a significant percentage of riders may be experiencing spinal misalignment that may be a manifestation of high neck misalignment termed the Atlas Subluxation Complex Syndrome².

METHODS

Through the assistance of the Alberta Barrel Racers Association (ABRA), an online survey was posted for their members and other equestrian visitors to complete. Eight questions were presented to satisfy the goals laid out. The survey was made available for a total of 6 months starting September 15, 2009 and ending March 15, 2010. Ninety nine riders participated in the survey with the results shown in the Data section below. The objective was to obtain a representative sampling of barrel racers in Alberta to establish the extent to which spinal misalignment may exist in this sports community.

DATA COLLECTED

Q1: Please indicate your gender.

This question was presented to establish the gender representation in the sample population.

Results: 89 of the total respondents answered this question with 88 reporting female and 1 male.

Q2: Please indicate your age in years.

An analysis of the age distribution of survey participants came from this question.

Results: 90 respondents input their age. The range was from 15 to 63 with an average of 35 and a standard deviation of 12.3 years.

Q3: Are your stirrups set evenly?

With this question we are able to group respondents into either an “even” stirrups setting category or an “uneven” category. This was performed to determine later if the presence of pain and discomfort was different for the two categories.

Results: 90 of the total respondents answered this question with 59 reporting yes (even) and 31 no (uneven).

Q4: If no, then which stirrup is higher up?

We asked this question to determine if there was any predominance of one side over the other in riders who adjust their stirrups unevenly.

Results: 19 respondents indicated the right stirrup as being higher, 13 indicated the left side.

Q5: How many holes higher is the shorter stirrup?

This question was asked to allow the authors to semi-quantitatively measure the severity of stirrup setting inequality.

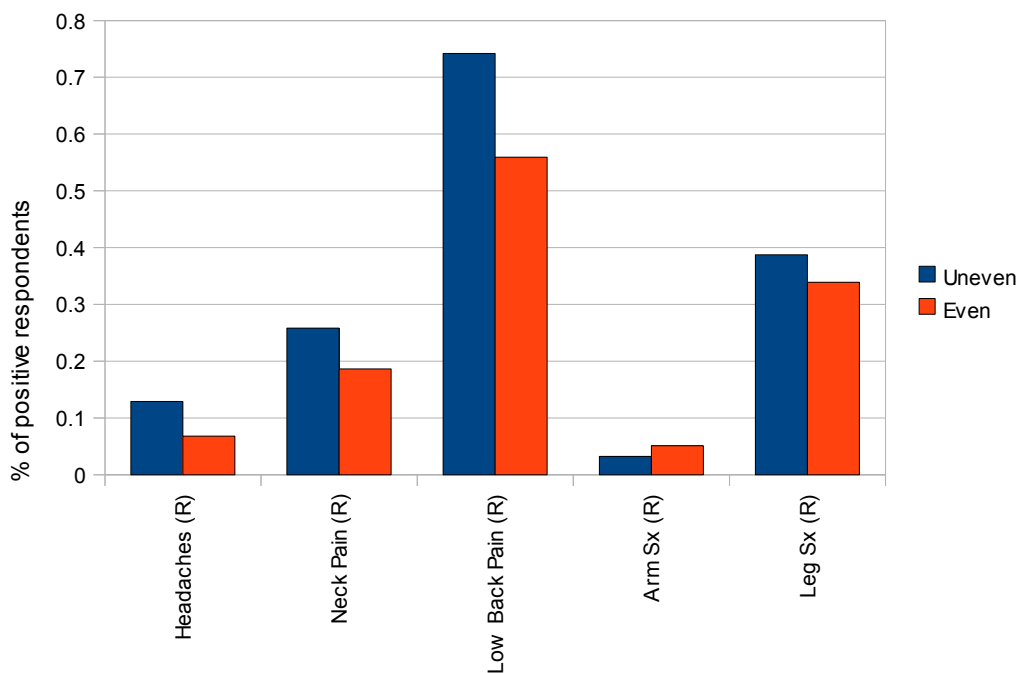
Results: 25 indicated 1 hole, 5 indicated 2 holes, and 2 indicated 3 holes with no one reporting 4 or more holes difference.

Q6: Which of the symptoms listed do you experience when riding? (headaches, neck pain, low back pain, arm/hand pain/numbness, leg/foot pain/numbness)

In this question the authors wished to determine the distribution of pain and discomfort symptoms present in respondents when they are riding.

Results: Headaches – 8, Neck pain – 19, Low back pain – 56, Arm pain/numbness – 4, Leg pain/numbness – 32.

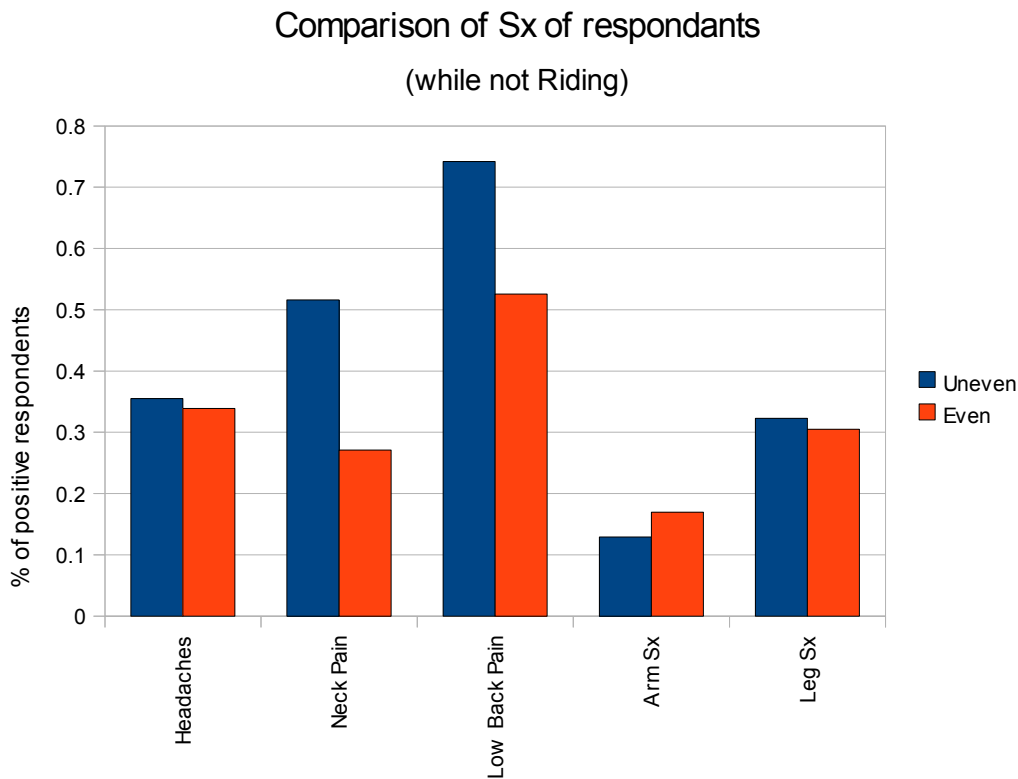
Comparison of Sx of respondents
(while Riding)



Q7: Which of the symptoms listed do you experience even when not riding? (headaches, neck pain, low back pain, arm/hand pain/numbness, leg/foot pain/numbness)

The authors asked this question to determine the overall distribution of symptoms, which are often attributed to spinal misalignment (subluxation), in equestrians.

Results: Headaches – 31, Neck pain – 32, Low back pain – 54, Arm pain/numbness – 14, Leg pain/numbness – 28.



Q8: Have you had your spine/pelvis checked for degrees of imbalance?

This question was presented to assess the overall level of awareness in the respondents that pelvic imbalance is a measurable health concern.

Results: 90 of the total respondents answered this question with 39 reporting yes they had, and 51 reporting that they had not.

DISCUSSION OF RESULTS

According to ABRA's records, the total membership stood at 928 in 2009, and, as of the end of the survey period, at 655 in 2010. ABRA estimates that 5% to 10% of their members are male. Participation in this survey was considered to be statistically significant with between 10.7% and 15.1% of the general membership participating.

The response of a significant number (34.4%, representing potentially 320 total riders) of participants who adjust their stirrups unevenly (Q3 & Q5) suggests that leg length inequality that may be due to spinal misalignment is present in many riders. Clinical experience as well as many published articles

supports the position that an upper cervical injury leading to pelvic unleveling is a significant causative factor of functional leg length inequality^{2,3,4}. Additionally, a percentage of participants reporting having even stirrups may have pelvic distortions that were less than the distance offered between adjacent holes in the girth strap. Depending on saddle design (English, western, etc.) and amount of wear, the distance between the girth strap holes can vary. Typically, distances ranging between 2.5 cm and 3.2 cm are found in un-worn straps. The responses to Q4 indicate a slightly greater frequency of right stirrup selection for the high side. Research comparing these stirrup observations with measured standing hip positions has not been performed and is indicated.

When comparing the responses to Q6 and Q7 it appears that the presence of some body discomforts and pains is actually lower when riding in most cases. This may suggest that riding provides a therapeutic effect to the spine due to the motion of the horse or rider when riding. Also worth noting is that in studies done within the general population (not specific to equestrians), the prevalence of low back pain and the other spinal related symptoms is consistent with the results gathered in this study. This suggests that there may be no greater likelihood of back pain (or injury) among riders as compared to non-riders.

We see in the responses to Q8 that pelvic balance is a concern amongst members of the barrel racing population and is shared between the two main groups identified (31 respondents reporting uneven stirrups versus 39 reporting their spine/pelvis having been measured for imbalance). An element of bias may exist due to the survey being linked through a chiropractic clinic site. The authors feel however that the sample size and response frequencies suggest a strong correlation exists between the two groups identified with Q3.

The results of this pilot investigation are considered to be highly representative of the sampled population. With the overwhelmingly large percentage of the total population participating in the survey, the analysis of the data offered by the authors may be considered highly representative not only of barrel racers, could possibly be extrapolated to equestrians in general. The authors believe that these results illustrate that a significant percentage of horse riders may be experiencing spinal misalignment that in turn may not only adversely affect their health, but may also have a deleterious effect on their riding and safety. Loss of optimal spinal balance is hypothesized to cause problems with horse control leading to an increased risk to falls. Further, the adverse effect of spinal misalignment on horse performance may be of significance to the competitive rider. In order to accurately measure and correct the misaligned spine, detailed postural analysis and x-rays are required. The protocol exists within the auspices of NUCCA (National Upper Cervical Chiropractic Association) trained Doctors of Chiropractic. NUCCA has been researching and developing a procedure to reduce spinal misalignment and its attendant pelvic imbalance and leg length inequality since the 1960's. Details on the clinical management of spinal misalignment is available from NUCCA online from www.providencenucca.com, www.nucca.org, and www.ucrf.org.

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Respectfully submitted on behalf of Providence Chiropractic Clinic by Ben Kuhn, DC and Kevin Creswell, DC Bsc (www.providencenucca.com).

1 Bailey HW. Theoretical Significance of Postural Imbalance, Especially the "Short Leg." *J Am Osteopath Assoc*, 1978; 77(6):452-455

2 Gregory RR. A Model for the Supine Leg Check. *Upper Cervical Monograph*, 1979; 2(6):1-5

3 Thomas MD. Leg Length Inequality in the Chiropractic and Medical Literature. *Upper Cervical Monograph*, 1991; 5(2):12-16

4. Seeman DC. Bilateral Weight Differential and Functional Short Leg: An Analysis of Pre and Post Data after Reduction of an Atlas Subluxation. *Chiropr Res J*, 1993; 2(3):33-38