



## COMPARISON OF POMMEL HORSE ROUTINES AMONG MALE GYMNASTS ON THE BASIS OF THEIR BRAIN HEMISPHERE DOMINANCE

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### ABSTRACT

*The present study assessed the impact of brain hemisphere dominance on pommel horse routine among male gymnasts. This study was conducted on 50 inter-university male gymnasts and their brain hemisphere dominance was mapped with the help of brain hemisphere dominance test constructed and standardized by Agashe and Helode (2007). Scores on pommel horse apparatus was noted from official score book. One way ANOVA analysis reveal non significant impact of brain laterality of male gymnasts i.e. left, right and integrated brain hemisphere dominance on pommel horse routine but male gymnasts with right brain hemisphere dominance showed better scores than male gymnasts with left as well as integrated brain hemisphere dominance. The results are discussed in the light of well established theories of laterality of brain and motor skills.*



**KEYWORDS :** Brain hemisphere domination, pommel horse, male gymnast.

### INTRODUCTION:

In men's gymnastics, pommel horse is considered to be toughest among all the routines. It is part of men's artistic gymnastic competition. According to Olympic order it is second apparatus because the order of performance being floor, pommel horse, roman rings, vault table, parallel bars and high bar. It requires a continuous motor skills and majority of the time executed using only one hand. In this routine the hips rotate in a perpetual motion while the legs act as scissors. In pommel horse routine, the gymnast is not allowed to stop or pause ones he mounts on the apparatus.

Being such a popular sport world over, researchers like Bencke et al. (2002), Tsopani et al. (2011), Heinen (2010), Kochanowicz (2013), Maleki et al. (2014), Sibanc et al. (2016) have highlighted the physical, physiological, motor skills, cognitive, biomechanical and psychological factors affecting gymnasts performance. Since majority of these factors are associated with specific hemisphere of our brain it is surprising that this aspect has not been studied in gymnastic performance. Human brain consists of left and right hemisphere. Left and right hemisphere is linked to each other. The movement of right side of our body is controlled by left brain hemisphere and left side of our body movements are controlled by right brain hemisphere. Hence a person can be left handed or right handed or both in some cases. Since psycho-motor domain is located in right brain hemisphere, it is believed that sportsperson with right brain hemisphere dominance i.e. left handed players have advantage in sports. This fact is also highlighted by Harung et al. (2011), Baker and Schorer (2013), Sorokowski (2014) and they reported that importance of brain laterality in execution of psycho-motor skills.

In pommel horse apparatus balance and flexibility is the key for seamless movements without pausing requiring superior psychomotor skills. Hence researcher decided to assess pommel horse routines of male gymnasts on the basis of their brain hemisphere dominance.

### OBJECTIVES

The objective of the present study is to find out the difference in performance on pommel horse apparatus of male gymnasts with different brain laterality.

### HYPOTHESIS

Brain hemisphere dominance will have significant bearing on performance of male gymnasts on pommel horse apparatus.

### METHODOLOGY :-

The following methodological steps were taken in order to conduct the present study.

#### Sample :-

To conduct the study, 50 male gymnasts (Ave. age 22.34 yrs) were selected. The criterion for selection of these male gymnasts was participation in inter-university artistic gymnastic competition. Purposive sampling was used in the present study.

#### Tools:

Brain Hemisphere Dominance Test (B.H.D.T.) prepared by Agashe and Helode (2007) was used to assess left, right and integrated brain laterality. This test is prepared in Hindi and comprises of 12 multiple choice questions. This test is highly reliable and valid.

Scores on pommel horse apparatus was noted for each male gymnast from official scorebook.

#### Procedure:

50 male gymnast were selected as per inclusion criteria. BHDT prepared by Agashe and Helode (2007) was administered as per instructions given by the authors and norms of a scientific study. After scoring the same are divided by 12. Percentile norms for these BHDT scores were obtained and the scores while fall below 25th percentile were considered as left dominant brain hemisphere while scores over 75th percentile were considered as right dominant brain hemisphere. The score between 25th and 75th percentile were considered as integrated brain hemisphere dominance. By this method brain hemisphere dominance of each subject was ascertained.

The scores on pommel horse apparatus was noted from official scorebook. To compare performance of male gymnasts on pommel horse with reference to their brain laterality, one way ANOVA was used. The results are presented in table 1.

### ANALYSIS AND INTERPRETATION OF DATA

Table 1

Performance of Male Gymnasts with Left, Right and Integrated Brain Hemisphere Dominance on Pommel Horse

Groups	N	Mean	S.D.
Left Brain Hemisphere Domination	14	4.60	4.69
Right Brain Hemisphere Domination	11	7.02	3.79
Integrated Hemisphere Domination	25	3.50	4.19

**Table 1 (a)**  
**ANOVA Summary**

Source	df	Sum of Squares	Mean Square	F
Between Groups	02	94.832	47.416	2.61(NS)
Within Group	47	851.391	18.115	
Total	49	946.223		

NS Not Significant

Results obtained through One Way ANOVA clearly suggesting that performance of male gymnasts on pommel horse did not differ significantly on the basis of their hemispheric preference. The calculated  $F=2.61$  was not found to be statistically significant. Although results are not statistically significant, they are indicative of the fact that gymnasts with right brain hemisphere dominance performed far better on pommel horse apparatus ( $M=7.02$ ) as compared to male gymnasts with left ( $M=4.60$ ) and integrated brain hemisphere dominance ( $M=3.50$ )

## RESULT AND DISCUSSION

On the basis of analysis of data results clearly indicate superior performance of male gymnasts with right brain hemisphere dominance on pommel horse as compared to male gymnasts with left and integrated brain hemisphere dominance. The result reiterate the fact that fine motor skills and axial motor control are associated with right brain hemisphere i.e. left handed sportsperson have superior motor and psychomotor ability. The results are also consistent with the findings of Stirling (2003).

## CONCLUSION

On the basis of results it was concluded that hemispheric dominance may predict performance of male gymnast on pommel horse apparatus.

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