

Digit Ratio (2D:4D) Profile of Varsity Rugby Players

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ABSTRACT

High performance in sport and aggression has been reported to correlate with low digit ratio (2D:4D) due to high amount of testosterone received in the womb. In this study rugby is chosen because Universiti Teknologi MARA (UiTM) Pahang's rugby team is regarded as one of the top 3 teams among the UiTM branches rugby team, and also among other varsity rugby teams in the nation. The players were very talented as most of them have vast experiences playing for their own respective states from youth to the senior team level. Furthermore, rugby has been associated with aggression which is a direct relation to the production of hormone testosterone. Thus, this study was conducted in order to investigate the digit ratio profile of the rugby players (n=22). Their mean age score was 19.3±0.95 years old and 2D:4D were measured by using the MicroDicom software Based on the descriptive analysis, the findings showed that 20 players out of 22 players had low 2D:4D, with only 2 players had high 2D:4D with overall mean score .95±.031mm and the highest 2D:4D recorded were 1.02mm. The results were in line with the other past related evidence which stated that low 2D:4D were highly correlated with sporting ability and high performance across variety of sports. Therefore, we concluded most of the players in the current rugby team posed low 2D:4D, and may correlate with the team high rugby performance that contributes to most of their recent success.

Keywords: digit ratio 2D:4D, rugby, performance, testosterone, aggression

Introduction

Rugby is considered as one of the main sports in UiTM Pahang. It is a field based team consists of high frequency body contact which requires the players to be aggressive and masculine. A typical rugby match involved with frequent repeated intense bouts of sprinting, hitting and tackling, interspersed with short bouts of recovery. Hence, rugby is physically demanding, requiring players to draw upon a variety of fitness components including aerobic power, speed, muscular power and strength. Success in many sports, but particularly contact sports such as rugby, is associated with aggressiveness (Pokrywka et al., 2005), degree of risk taking and the ability to deal with potentially dangerous situations (Hoare & Warr, 2000). In accordance to the nature of the rugby game, high-risk/contact-sport players tend to have higher level of testosterone than low-risk/noncontact-sport players (Manning et al., 2001; 2007). The same goes with the findings from Hill et al. (2012) that correlates low 2D:4D with the testosterone attributes such as aggression, masculinity and high physical fitness in rugby.

The UiTM Pahang's rugby team is recognized as one of the top three best teams among the UiTM branch campuses and also among the nation top varsity rugby teams (see Table 2). Furthermore, the team itself has been consistently managed to compete in most of the semifinal and final matches in any rugby tournaments entered. In March 2013, the team successfully won the Sukan Remaja Pahang-Ragbi 7' side tournament, thus this currently put the team as the best youth rugby team in the Pahang state. The team also managed to play in both semifinal matches of Karnival Sukan Mahasiswa SeMalaysia (KARISMA) consecutively in year 2011 and 2012. Moreover, the team also competed in open category by playing against the more experienced amateur rugby clubs from the Johor state in Kluang Open 10's 2012. They were able to go through the semifinal match only to lose by one try against the eventual winner of that tournament. As for the players, most of them had experience in representing their own states, and some them play for amateur rugby clubs and also competed in the interstate national rugby league. Recently, there were eight players played for their respective states in the Malaysia Games 2013 (SUKMA), with one of them played in the final match and been nominated as one of the best player of the tournament.

Digit ratio has its own unique relationship to human performance in sports. Interest in digit ratio has been surging recently due to its function to give early predictions of the individual's ability in sports and other fields including among the financial traders (Coates et al., 2009). In particular, the high amount of testosterone, low estrogen or both received while in the womb (prenatal) influenced the 2D:4D to be more masculine (Manning et al., 2007; Bailey & Hurd, 2005). Lower digit ratio among men has been reported to correlate with positive impact on their ability to perform in football, or more general is associated with high level of attainment across a number of sports (Manning & Taylor, 2001). Moreover, it's also used as a biomarker for achievement in various sports, athletic disciplines such as sprinting (Manning et al., 2009). However, uncertainties and inconsistent data about the sporting athletic ability especially in rugby are still not clear and very few studies were done in that area. Along with the findings from Tester and Campbell (2007), they found that 2D:4D was negatively related to performance in football, rugby, and basketball.

It has been suggested that the formation of the cardiovascular system is sensitive to testosterone, and that low 2D:4D is a marker for high prenatal testosterone and an efficient vascular system in adults (Manning et al. 2000). This is in accord with those findings and support the possibility that an association between low 2D:4D and sports and athletic achievement results at least in part from the action of prenatal testosterone on such achievement. For prenatal testosterone to have this effect, it may improve the efficiency of the heart and vascular system, and/or it may influence behaviors which impact on sports achievement such as frequency of exercise (Hönekopp et al., 2006).

In determining which hand should be measured, the right hand is chosen due to certain reasons. The right-hand 2D:4D (subsequently 2D:4Dr) is a more powerful predictor of human behavior, and health than 2D:4D of the left hand (subsequently 2D:4Dl) (Nicholls et al., 2008 and Manning et al., 2007). Arguments in favour of this view are that the sex difference in 2D:4D appears to be larger in the right than in the left-hand (Manning et al., 2007); that 2D:4Dr predicts selected variables of interest more accurately than 2D:4Dl; and that male-typical traits tend to be more pronounced in the right side of the body whereas female-typical traits tend to be more pronounced in the left side of the body. Consequently, 2D:4D researchers who confine their studies to one hand consistently choose the right-hand (Manning et al., 2001; 2007; Tester & Campbell, 2007).

Therefore, this study try to investigate the 2D:4D profile of the varsity rugby players in their right hand, and which we hypothesized that varsity rugby players should have lower 2D:4D to link with the high rugby performance and the nature of the game itself.

Methods

Participants

Total of 22 male rugby players ($n=22$) currently studying and at the same time representing UiTM Pahang's rugby team were participated in this study. The participants actively attended the training sessions 4 times per week. Divided by the playing positions, there were 12 players in backs positions and 10 players in the forward positions.

Assesment of digit ratio

The participants were instructed to straighten their fingers and lightly place their hands palm down on the scanner machine. By using the MicroDicom software, the measuring technique is done by taking measures from the central point of the tip of the second finger to the central point of the basal crease of the second digit and divided by the same measure from the fourth digit. All measurements were made twice by the same observer and the average score were recorded. Values lower then 1mm indicate that the ring finger is longer than the index finger (Tester & Campbell, 2007).

Results

The mean age of the rugby players was 19.3 ± 0.95 years old, with most of the rugby players are still in their diploma and only 2 players are currently studying their undergraduate course. As shown on Table 1, the descriptive of 2D:4D for the participants which displayed the mean score of 0.95 ± 0.031 mm.

Table 1: 2D:4D mean score of the rugby players

	N	2D:4D lowest (mm)	2D:4D highest (mm)	Mean±SD
2D:4D	22	.87	1.02	.95±.031

*Values lower than 1mm is recorded as low 2D:4D.

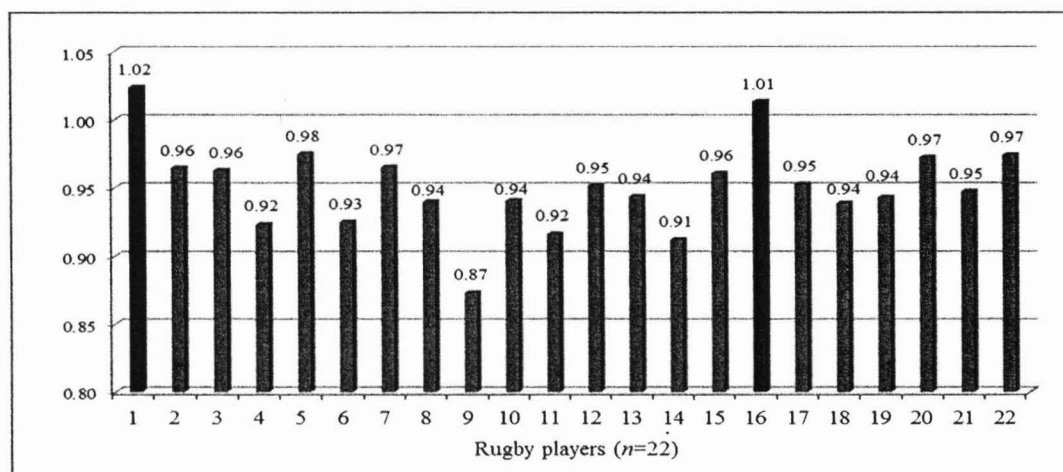


Figure 1: 2D:4D of the rugby players.

After the measurement, we found that 20 out of 22 rugby players had low 2D:4D and only 2 rugby players had high 2D:4D. The 2D:4D was determined lowest in one participant with score of 0.87mm and the highest was recorded with score 1.02mm as seen on Table 1 and Figure 1.

Table 2: UiTM Pahang's rugby team achievements

Tournaments	Achievement	Year
UiTM Segamat Canterbury 10's 2013	Final (2 nd place-Cup category)	2013
Politeknik Ragbi 10' sebelah	Final (Champion-Bowl category)	2013
Sukan Remaja Pahang-Ragbi 7' sebelah	Final (Champion-Cup category)	2013
UiTM International Sports Fiesta 7's	Final (Champion-Bowl category)	2013
KARISMA 2012	Semifinalist (3 rd place-Cup category)	2012
Kluang Open 10's	Semifinalist (3 rd place-Cup category)	2012
UiTM International Sports Fiesta 7's	Final (Champion-Plate category)	2012
UiTM Segamat Canterbury 10's 2012	Final (2 nd place-Cup category)	2012
Liga Ragbi Pahang	Final (2 nd place)	2011
KARISMA 2011	Semifinalist (3 rd place-Cup category)	2011
UiTM Segamat Canterbury 10's 2011	Semifinalist (3 rd place-Cup category)	2011

For the past three years from year 2011 to year 2013, the rugby team competed in intersarsity category and also in open category. Overall, the team always managed to go through the quarter final phase and has been consistently able to compete in seven final matches and four semifinal matches in all tournaments entered as seen on Table 2.

Discussion

The aim of this study was to investigate the digit ratio status of the varsity rugby players. Based on the results, our data revealed that 20 rugby players (98%) out of 22 rugby players had low 2D:4D. By taking into consideration of their high performance for the past three years, we can link it with the other past studies that suggest low 2D:4D in men is a correlate for high ability in many sports, including rugby (Manning & Taylor, 2001). Moreover, the present evidences are in accord with previous studies that high-risk/contact-sport players tend to have lower digit ratio (Manning et al., 2001; 2007). Regarding to the 2 rugby players that had high 2D:4D, it's not that significant if compared to the other 20 rugby players that had low 2D:4D. However, it's interesting to find that one of the 2 rugby players was a key player of the team and surprisingly he posed a good muscular physique. The other rugby player however is not in the first team and posed a small and thin body. Related evidence (Bennett et al., 2010) suggests that most of the reserve rugby players had high 2D:4D compared to the first team rugby players.

Despite the high numbers of players that have low 2D:4D, the rugby team consistent performance is not solely depending on the low digit ratio. The improvements in performance and consistency is may influenced by other factors such as player status, number of years playing, experiences, physiological, physique and psychological status, and the training itself. Effort variables (years playing and hours per week training) were also strongly associated with higher sports achievement (Tester & Campbell, 2007) and indeed, any other result would have been surprising and disheartening. But, again, their contribution did not eliminate the low digit ratio effect.

Conclusion

This is a very straightforward and simple study conducted in order to find the digit ratio profile of UiTM Pahang's rugby team. The results were encouraging as it agreed with other past related findings. In a study by Manning and Taylor (2001), men with low 2D:4D ratio reported higher performance in a range of sports and had higher visual-spatial ability, another positive trait in sport. As rugby is a contact sport, the sport itself is very aggressive. Although aggressiveness is not tantamount to competitiveness, it is usually correlated and therefore may also be a positive characteristic in sport (Pokrywka et al., 2005). Therefore, we may speculate that low 2D:4D may be a positive correlate of sports potential and performance of the rugby team. However, this study only investigates the digit ratio profile. Further work is needed to find the exact relationships of digit ratio with other physical fitness variables and also physiological variables along with the team performance.

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