

A COMPARISON OF THE STYLE OF PLAY AND INCIDENCE OF INJURY UNDER THE 5 VERSUS 10 METRE RULE IN JUNIOR RUGBY LEAGUE

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FINAL REPORT

FINDINGS AND RECOMMENDATIONS

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EXECUTIVE SUMMARY: INJURY REPORT

For the purposes of this study an injury was defined as any pain or disability sustained by a player during a junior rugby league match and subsequently assessed by the trainer and reported via an injury report form.

- The data presented here indicated a lower incidence of injuries for the 10m versus 5m game when the injury rate was expressed either as injuries per game or injuries per 1000 hours of game time. The injury rate reported in this study was 33 (5m) or 14.6 (10m) per 1000 hours of game time
- Incidence rates reported in previous literature
 - NRL (missed game) 38.7/1000 hrs (O'Connor, 2008)
 - Semi professional RL: 68/1000 hrs (Gabbett, 2001)
 - Junior AFL (training & game): 20.1/1000 hrs (Finch et al, 2002)
- The total sample consisted of 871 players (427 5m rule; 444 10m rule). 73 (17%) players participating under the 5m rule were injured and 61 (14%) players participating under the 10m rule were injured (14%).
- Only 80 injuries (from 134) identified injury type. Of the injuries that were identified the general category of 'pain' accounted for the most injuries followed by 'swelling' under both rule conditions. There were more dislocations and head injuries reported under the 10m rule.
- There were similar injury profiles for the 10m and 5m rule conditions in relation in to injured body region: head/neck (29% injuries), and upper (39% 10m; 36% 5m) and lower limbs (27% 10m; 23% 5m). However more injuries to the trunk were sustained under the 5m rule.
- The average number of tackles per game was similar between the 10m and 5m rules at 115 and 110 tackles per game respectively
- The difference in the injury rate between the 5m and 10m games cannot be explained in terms of total number of collisions (tackles in a game) as the difference here was small (4.5%) in the opposite direction to the injury rate per game (i.e. slightly more tackles in the 10m game yet a lower rate of injury).
- Other factors such as numbers of players in a team, player rotation etc. may need to be considered

Current Recommendations

Based on the research analysis, the following changes are recommended.

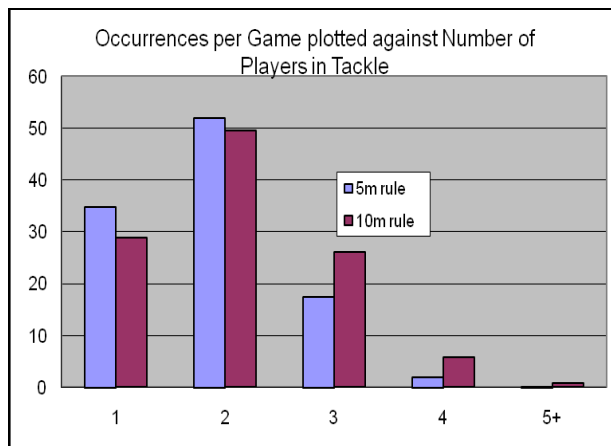
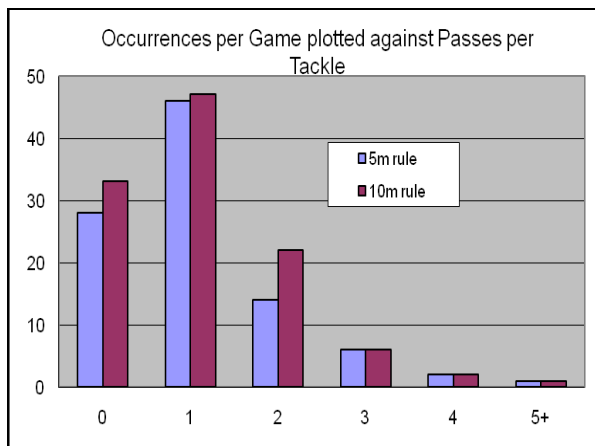
1. The mechanism of injury needs to be added onto the injury reporting sheets. Terms to include: tackle, collision with player/object, shoulder charge, kicking, scrum, landing/fall/stumble, running, sidestep, twisting to pass/accelerate, other.
2. The category of 'strain' and 'sprain' should be added to the list for type of injury in the future.
3. On injury the reporting sheet, identify whether the player; i) stayed on the field after injury, ii) removed from field and then return later in the game or, iii) removed from field and did not return in that game.
4. Ensure all fields on the report form are completed to allow for more complete understanding of the injury.

EXECUTIVE SUMMARY: GAME ANALYSIS

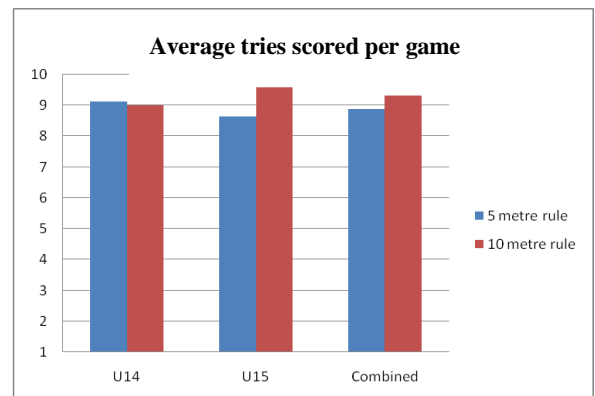
29 games were videoed and then analysed by SportsCode game analysis software. The documentation and analysis of the games was based on the approach of Harvey (2007). One game was rejected due to an unexplained low number of tackles. Distribution of games analysed are 10m U14 (6), 10m U15 (7), 5m U14 (8) and 5m U15 (8).

The results showed the following main effects:

- The average number of tackles per game was similar between the 10m and 5m rules at 123 and 110 tackles per game respectively ($P=0.528$).
- No difference was determined for the number of passes per tackle for the 5 versus 10m rules.
- On average, there were more players in a tackle for the U14 versus U15 age group.
- There were more passes per tackle for the U14 versus U15 age independent of the rule
- There were a greater number of tackles where 0, 1 or 2 passes were thrown.
- No difference was seen between the 5 and 10m rule for numbers of players in the tackle.
- There were more tackles with a lower number of players in the tackle for both the 5 and 10m rules.



- Total tries scored per game for 5 and 10m rule are similar at approximately 9 tries per game. Under both rules, more tries were scored in the first versus second half.
- The peak period for scoring tries for both rules occurred in the 10-20 minute period of the first half.
- There were effectively no tries scored in the final 10 minutes of the game for the 5m rule and around one try per game in the last 10 minutes for the 10m rule.
- With the try line divided into 5 equal segments the majority of tries were scored in the centre 60% for the 5m rule.
- For the 10m rule there was a more even distribution of tries for the left wing and centre 60% of the field versus the right wing.
- For both the 5 and 10m rule most try scoring moves contained one or two passes. For the 10m rule more tries were scored on Tackle 2 than any other tackle.
- The 5m rule had double the number of tries scored on the fifth tackle when compared to the 10m rule.
- Overall there appeared to be no difference between the 5 v 10 m rule for tries scored, players in tackles and number of passes per tackle. Most differences observed were between the age groups.



INTRODUCTION:

BACKGROUND

Rugby league is a contact or collision sport where the ball carrier is tackled (stopped) by the physical intervention of another player. Injuries may occur as a result of direction collision of players, forceful contact of a player with the ground either during or after a tackle or, by players during running or change of direction manoeuvres whether they are in possession of the ball or not.

Little systematic research appears to exist. Hoskins and Pollard (2006) state “The literature on rugby league injury is small but growing...” and “The implementation (of an injury surveillance program) could provide important information in the identification and prevention of risk factors for injury.”

Gabbert (2004) undertook a review of the incidence of injuries in rugby leagues and reported that in junior rugby leagues the knee was the most common site of injury and that injuries are most commonly sustained in tackles by the tackled player. In an analysis of the incidence of injuries in junior rugby leagues over a four year period Gabbert (2007) has identified data at variance with the initial review (Gabbert 2004).

Gabbert (2007) reported that in junior rugby league an overall injury rate of 56.8 injuries per 1000 hours of playing time. In this study the most common site of injury was the shoulder (15.6 per 1000 hours), and the most common type of injuries were sprains (24.7 per 1000 hours). Injuries were most commonly sustained while being tackled (19.2 per 1000 hours) and while tackling (10.1 per 1000 hours).

An unpublished study of injuries in the 2007 National Rugby League Competition (O’Connor, 2008) showed 38.7 injuries per 1000 hours that resulted in one or more games missed and overall 109.3 injuries recorded per 1000 hours. Sprains were the most frequent injury (20.7%) and the most frequent mechanism being “tackled/collision” (39.0%).

RATIONALE

There is a perception by football officials that reducing the 10 metre “play-the-ball” rule to a 5 metre rule will reduce the rate of injuries in junior rugby league due to the reduced velocity of collisions. There is the potential that with a reduced distance between teams that the attacking players are at a lower velocity when contact occurs and that the collision forces are reduced. Data from our laboratory on junior footballers indicate that mean velocity for 0-5 m in a maximal sprint test is 4.21 m.sec⁻¹ compared to a mean velocity of 6.57 m.sec⁻¹ for the 5-10m split. This suggests that with 5 vs 10m between players then collision forces (as estimated from differences in mean velocity) will be 36% lower in a 5m game.

It is also thought that the 5 metre rule encourages lateral movement of the ball away from the “play-the-ball” area, and this will result in fewer players in the tackle and a lower incidence of injury. No formal research exists to support this premise so this study is designed to test it.

AIMS & OBJECTIVES

1. To examine the incidence and types of injuries under the 5 v 10 metre rule in junior rugby league players
2. To examine the style of play under the 5 v 10 metre rule in junior rugby league

This research has a formal null hypothesis “that there is no difference in injury rate or types of injury under the 5 versus 10 metre rule in junior rugby league”. If the null hypothesis is rejected then data will be analysed to provide information back to the Rugby League Research Board on the differences in the rates and types of injuries between the 5 versus 10 metre rule and if data from the Game Analysis procedures identifies potential causative factors. This information could be used to make rules changes that make the game safer for junior players.

SUBJECTS

Participants were drawn from the under 14 and under 15 levels of the Canterbury Bankstown and South Sydney Districts of the NSW Rugby League. These 2 districts were chosen for a number of reasons including: i) differences in playing rules (5m @ South Sydney, 10m @ Canterbury Bankstown), ii) geographical closeness to reduce environmental differences affecting the results (Gabbert et al 2007), iii) similar population sizes (427 players in South Sydney, 444 players in Canterbury Bankstown), iv) support from the both districts to participate in the study.

Canterbury Bankstown District Junior Rugby League had 23 teams analyzed and South Sydney District Junior Rugby League had 18 teams analyzed in the study. Below is a breakdown of player numbers and teams within each district and age group.

TEAMS				PLAYERS			PLAYERS/TEAM		
District	U/14	U/15	TOTAL	U/14	U/15	TOTAL	U/14	U/15	TOTAL
10m (CB)	13	10	23	247	197	444	19	19.7	19.3
5m (SS)	9	9	18	204	223	427	22.6	24.7	23.7

METHODS

Injury Surveillance

Data on injuries that occurred during games were collected via the injury reporting forms that were completed by the ground officials at each of the game venues. The ground officials who manage this process are either paramedics or accredited sports trainers (a copy of the injury reporting form is attached). An injury was defined as any pain or disability sustained by a player during a junior rugby league match and subsequently assessed (Gabbett, 2000) by the trainer and reported via an injury report form.

Data are expressed as a rate function of number of injuries per 1000 hours playing time. Playing time was estimated from the total number of games played under each rule multiplied by the duration of the game and normal number of players on the field of play at one time (26). Data from the date and time will be used to cross-reference the environmental conditions collected by

automated Bureau of Meteorology sites. The environmental conditions will be factored into the analysis to look at their effects on rates and types of injury.

Game Analysis

Five rounds of the competition in each district were videoed and analysed to collect data to examine the effect of the 5 v 10 metre rule on game factors and collect this data for examination with and correlation to rates of injury. Game numbers analysed were 29 with one set of data rejected due to an unexplained low number of tackles. Distribution of games analysed are 10m U14 (6), 10m U15 (7), 5m U14 (8) and 5m U15 (8). Games were downloaded to, and analysed by, SportsCode game analysis software. The documentation and analysis of the games was based on the approach of Harvey (2007).

Identified Areas of Investigation

The following areas were analysed from the information given in the Injury Reports:

Description:

- Age
- 5m v 10m rule
- Club
- Ground/venue
- When in season injury occurred (month)

Injury Profile:

- Frequency of injury
- Injury Type
- Injury Side
- Site of injury
- Body Region
- Incidence rate

Mechanisms:

- From those identified (cause of injury- tackle etc)

Severity:

- Removal from field
- Immediate care
- Emergency care

The following areas were analysed from video analysis of games recorded:

1. Number of passes per tackle
2. Number of players in tackles
3. Number of tackles per game and per team
4. Number of tries scored
 - a. When in game scored
 - b. Where on field scored

Data Analysis and Statistics

Data were analysed by ANOVA techniques with the 5 versus 10 metre game rule used as the main effect to look for significant differences ($p < 0.05$) in the rates of injuries.

The rate of each type of injury (dependent) were analysed to determine the significance of the difference between games played under the 5 v 10m rule (independent). Injury data received from the 2 associations were defined categorically using the classification system implemented by O'Connor (2008).

Bonferroni correction will be used to control for multiple comparisons of data. Where appropriate, effects sizes will be determined by the calculation of Cohen's "d" and the relative size of the effect reported.

RESEARCH CHAPTER ONE:

Injury Results and Discussion

Overall Injuries

Number of Injuries / Incidence Rate (Tables 1-3)

73 (17%) players participating under the 5m rule were injured and 61 (14%) players participating under the 10m rule were injured (14%).

The rate of injuries per game for the 5m rule was 0.716, and 0.316 for the 10m rule. In raw terms this data indicates the rate of injury was higher for the 5m versus 10m rule.

Table 1. Incident rates of injuries per game for 5m v 10m rule

District	Number of Injuries	Number of games	Incident rate per game
5m rule	73	102	0.716
10m rule	61	193	0.316

Table 2. Incident rates of injuries per game by 5m v10m rule and age

District /Age	Number of Injuries	Number of games	Incident rate per game
5m rule U/14	38	61	0.623
5m rule U/15	35	61	0.574
10m rule U/14	29	108	0.259
10m rule U/15	33	85	0.388

Table 3. Estimate of number of hours played and injury rate per 1000 hours playing time

District	Number of games	Total Hours of Play	Injuries per 1000 hours
5m rule	102	2210	33.0
10m rule	193	4182	14.6

Injury rates in football can be affected by a number of factors. As rugby league is a collision sport and most injuries arise from collisions the number of tackles in a game could contribute to the injury rate. Junior rugby league also operates on an unlimited interchange meaning a team with a larger squad could rotate its players more frequently and maintain a higher degree of game intensity which may predispose to a higher rate of injury. In this study the district playing under the 5m rule had an average squad size of 23.7 players and under the 10m rule 19.3 players

Types of Injuries (Tables 4-5)

Below are tables identifying the breakdown of injury type. The first table represents injuries by rule (5m and 10m), and the second table shows injuries by rule and age group. Each table shows the number of each injury and the percentage compared to all injuries recorded.

Table 4. Injury type by rule

Injury Type	5m v 10m			
	10m rule #	10m rule %	5m rule #	5m rule %
Bleeding	3	5.2	3	13.6
Dislocation	6	10.3	2	4.5
Fracture	2	3.4	0	0.0
Swelling	8	13.8	4	18.2
Pain	30	51.7	10	45.5
Head Injury	6	10.3	1	4.5
Spinal Injury	1	1.7	2	9.1
Laceration	2	3.4	1	4.5

Table 5. Injury type by rule and age

Injury Type	5m v 10m / Age							
	U/14 10m rule #	U/14 10m rule %	U/15 10m rule #	U/15 10m rule %	U/14 5m rule #	U/14 5m rule %	U/15 5m rule #	U/15 5m rule %
Bleeding	1	3.7	2	6.5	1	10.0	2	16.7
Dislocation	4	14.8	2	6.5	0	0.0	1	8.3
Fracture	0	0.0	2	6.5	0	0.0	0	0.0
Swelling	2	7.4	6	19.4	2	20.0	2	16.7
Pain	14	51.9	16	51.6	6	60.0	4	33.3
Head Injury	4	14.8	2	6.5	0	0.0	1	8.3
Spinal Injury	1	3.7	0	0.0	1	10.0	1	8.3
Laceration	1	3.7	1	3.2	0	0.0	1	8.3

From the 134 recorded injury forms from the two districts, only 80 in total identified injury type. This does not allow accurate calculation of injury percentages. No injury forms recorded abrasions or internal injury. No fractures were reported from the 5m rule. Of the injuries that were identified the general category of ‘pain’ accounted for the most injuries followed by ‘swelling’ under both rule conditions. There were more dislocations and head injuries reported under the 10m rule.

Injury Sites (Tables 6-9)

The following categories were chosen from previous RL studies (O'Connor 2008). Due to the relatively small sample size, injury sites were clustered into Body Region to increase the power of a (gross) analysis based on injury location.

Site of injury included:

- Abdomen
- Ankle
- Elbow
- Foot
- Forearm
- Hand
- Head(nose)
- Hip/groin
- Knee
- Lower leg
- Lumbar back
- Neck
- Pelvis
- Shoulder
- Thigh
- Thorax
- Wrist

Body Region:

- Head/neck
- Arms/shoulder
- Trunk
- Legs/hip

Injury Side:

- Left
- Right
- Bilateral
- Centre

The tables below identify the breakdown of the injured Body Regions for rule and age group/rule. Table 6 and 7 illustrate similar injury profiles for the head/neck, and upper and lower limbs. However more injuries to the trunk were sustained under the 5m rule. The upper limbs accounted for the majority of injuries with the trunk sustaining the least injuries.

Table 6. Injured Body region by rule

Body Segment	5m v 10m			
	10m rule #	10m rule %	5m rule #	5m rule %
Head/neck	17	28.8	21	28.8
Arms/Shoulder	23	39.0	26	35.6
Trunk	3	5.1	9	12.3
Legs/Hip	16	27.1	17	23.3

Table 7. Injured Body region by rule and age

Body Segment	5m v 10m/Age							
	U/14 10m rule #	U/14 10m rule %	U/15 10m rule #	U/15 10m rule %	U/14 5m rule #	U/14 5m rule %	U/15 5m rule #	U/15 5m rule %
Head/neck	9	32.1	8	25.8	13	34.2	8	22.9
Arms/Shoulder	8	28.6	15	48.4	12	31.6	14	40.0
Trunk	3	10.7	0	0.0	4	10.5	5	14.3
Legs/Hip	8	28.6	8	25.8	9	23.7	8	22.9

Tables 8 and 9 identify the breakdown of the injured sites for rule and age group/rule.

Table 8. Injured sites by rule

Injury Site	5m v 10m			
	10m rule #	10m rule %	5m rule #	5m rule %
Ankle	8	13.6	5	6.8
Elbow	1	1.7	5	6.8
Foot	0	0.0	1	1.4
Forearm	1	1.7	1	1.4
Hand	2	3.4	11	15.1
Head (nose)	15	25.4	15	20.5
Hip/Groin	0	0.0	2	2.7
Knee	7	11.9	9	12.3
Lower Leg	1	1.7	0	0.0
Lumbar Back	2	3.4	2	2.7
Neck	2	3.4	3	4.1
Shoulder	14	23.7	11	15.1
Thorax	1	1.7	7	9.6
Wrist	5	8.5	1	1.4
TOTAL	59		73	

Table 9. Injured sites by rule and age

Injury Site	5m v 10m/Age							
	U/14 10m rule #	U/14 10m rule %	U/15 10m rule #	U/15 10m rule %	U/14 5m rule #	U/14 5m rule %	U/15 5m rule #	U/15 5m rule %
Ankle	3	10.7	5	16.1	1	2.6	4	11.4
Elbow	0	0.0	1	3.2	2	5.3	3	8.6
Foot	0	0.0	0	0.0	1	2.6	0	0.0
Forearm	0	0.0	1	3.2	0	0.0	1	2.9
Hand	2	7.1	0	0.0	5	13.2	6	17.1
Head (nose)	7	25.0	8	25.8	12	31.6	3	8.6
Hip/Groin	0	0.0	0	0.0	0	0.0	2	5.7
Knee	4	14.3	3	9.7	7	18.4	2	5.7
Lower Leg	1	3.6	0	0.0	0	0.0	0	0.0
Lumbar Back	2	7.1	0	0.0	1	2.6	1	2.9
Neck	2	7.1	0	0.0	1	2.6	2	5.7
Shoulder	6	21.4	8	25.8	4	10.5	7	20.0
Thorax	1	3.6	0	0.0	3	7.9	4	11.4
Wrist	0	0.0	5	16.1	1	2.6	0	0.0

From the 134 recorded injury forms from the two rules, 132 identified injury site. No injury data was recorded on abdomen, pelvis or thigh. No injuries were identified for Foot, Hip/groin for the 10m rule and no lower leg injuries for the 5m rule district. The main injury sites include:

- Head with 25.4% and 20.5 % (10m and 5m respectively)
- Shoulder with 23.7% and 15.1% (10m and 5m respectively)
- Knee with 11.9% and 12.3% (10m and 5m respectively)
- Ankle with 13.6% and 6.8% (10m and 5m respectively)

Mechanism

The main cause of each injury was included only on 32 of the 134 injury reports that were completed. Data on the mechanism of injury was gained from a review of the injury form as no specific area on the form was set aside for this. It is recommended that cause of injury be added into the injury reports filled out by trainers when an injury occurs.

Removal from Field (Tables 10-11)

Removal from the field information was available on 88 of the 134 reports (Table 10 and 11). All forms from the 10m district included removal from field information. Only 25 of the 73 forms from the 5m district recorded removal from field information so information in this section may be skewed due to potential non-reporting.

Table 10. Removal from field by rule

Removal from field	5m v 10m			
	10m rule #	10m rule %	5m rule #	5m rule %
Walked	29	47.5	25	92.6
Assisted	25	41.0	2	7.4
Ambulance	7	11.5	0	0.0

Table 11. Removal from field by rule and age

Removal from field	5m v 10m/Age							
	U/14 10m rule #	U/14 10m rule %	U/15 10m rule #	U/15 10m rule %	U/14 5m rule #	U/14 5m rule %	U/15 5m rule #	U/15 5m rule %
Walked	15	53.6	14	42.4	12	100.0	13	86.7
Assisted	10	35.7	15	45.5	0	0.0	2	13.3
Ambulance	3	10.7	4	12.1	0	0.0	0	0.0

From the 134 recorded injury forms from the two districts, 88 identified removal from field. Neither district identified removal from field by stretcher and no removal by ambulance for any players in the 5m rule.

It is recommended that removal from field be reported in all cases with additional criteria of “stayed on field” and “returned to field” to be provided for a complete set of options for cases where the player was treated on the field or returned to the field after removal and treatment.

Venue (Tables 12-13)

The following tables show the number of injuries at venues where injuries were reported. Data is presented as injuries per game

Table 12. Injury by venue (5m district)

District	Marrickville	Camperdown	Coogee	Snape	Erskineville	Woollahara	Mascot	Yarra
5m rule U/14	1.60	0.40	0.60	1.00	1.50	2.00	0.56	0.50
5m rule U/15	0.91		0.25	1.00	0.00		0.71	0.50
5m rule Total	1.04	0.40	0.35	1.00	0.86	2.00	0.63	0.50

Venues where no injuries occurred (game number in brackets) – Waverly (9), Pioneers (7) and Kensington (3).

Table 13. Injury by venue (10m district)

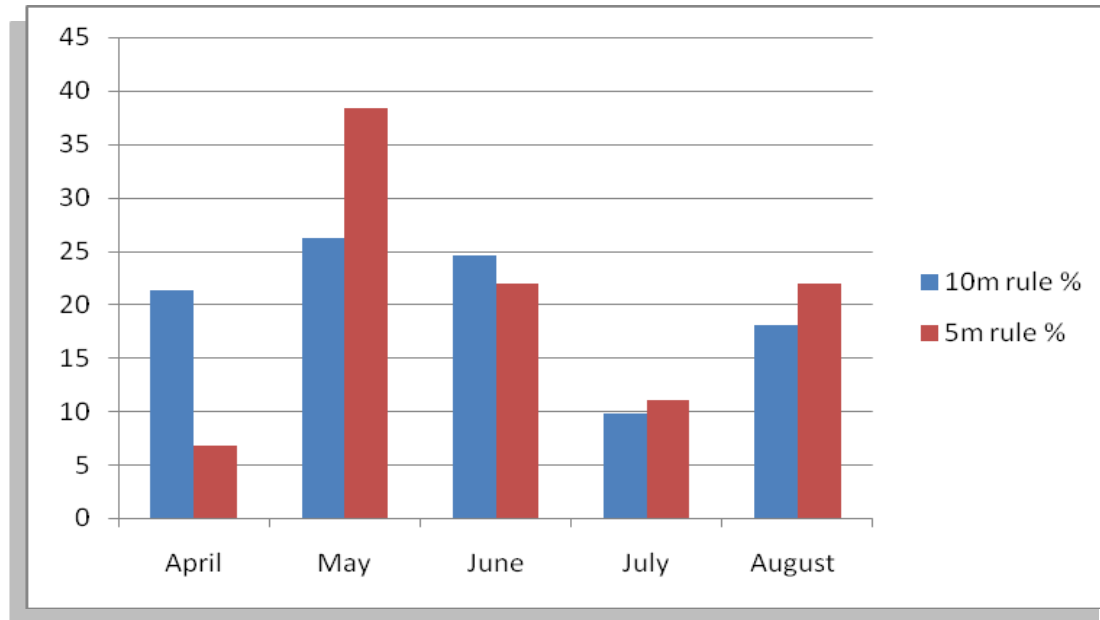
District	Smith Park	Clemon Park	Neptune Park	Hammondville	Jim Beggall	Peter Hislop	Terry Lamb	Delanney	Roberts Park	Padstow Park
10m rule U/14	0.15	0.38	0.25	0.16	0.42	1.00	0.38	0.25	0.00	0.00
10m rule U/15		1.33	0.00	0.71	0.64	0.33	0.50	0.50	0.11	0.13
10m rule Total	0.15	0.79	0.15	0.31	0.54	0.71	0.43	0.40	0.06	0.06

Venues where no injuries occurred (game number in brackets) – The Crest (1), Steve Folkes (19), Bankstown FC (15) and Belmore (3).

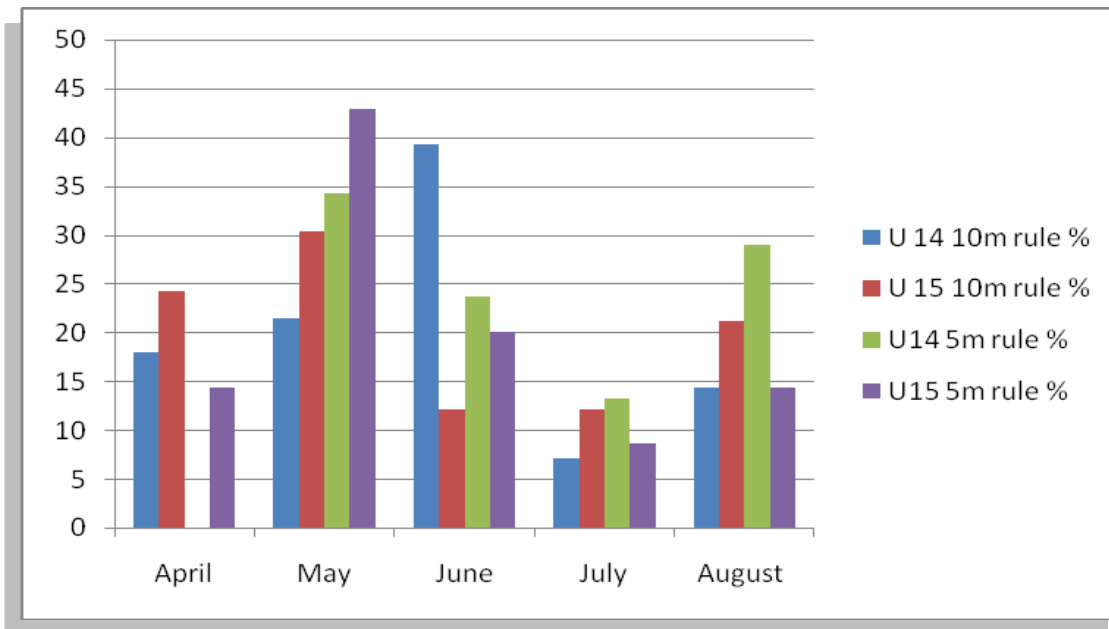
Competition Block (month)

The season was broken up into competition blocks based on each month of the season. The 2008 competition took place over 6 months. No injuries were recorded in September where a reduced number of games were played as only final series matches occurred here.

Graph 1. Percentage of injuries per month by rule



Graph 2. Percentage of injuries per month by rule and age



Summary

The data presented here indicated a lower incidence of injuries for the 10m versus 5m game when the injury rate was expressed either as injuries per game or injuries per 1000 hours of game time. The injury rate reported in this study was 33 (5m) or 14.6 (10m) per 1000 hours of game time.

The data for the 5m rule is higher than that reported for junior AFL at 20.1 injuries/1000 hours (Finch et al 2002). However the AFL data contained training and playing injury statistics. Combining training and competition data can reduce the reported injury rate to 40% of game only statistics, (Gabbett 2007) so a direct comparison cannot be made.

Data from O'Connor (2008) on NRL players showed an injury rate of 50.3/1000 hours while Gabbett (2001) on semi-professional rugby league players reported a rate of 68/1000 hours.

From these data it can be concluded that on "game only" data the injury rates in this study are below that of both NRL and semi-professional rugby league.

The difference in the injury rate between the 5m and 10m games cannot be explained in terms of total number of collisions (tackles in a game) as the difference here was small (4.5%) in the opposite direction to the injury rate per game (ie slightly more tackles in the 10m game yet a lower rate of injury).

Other factors such as numbers of players in a team, player rotation etc. may need to be considered

RESEARCH CHAPTER TWO:

Game Analysis Results and Discussion

All results shown are in averages (i.e. from games played), unless otherwise stated. The following areas were analysed from video analysis of games recorded:

- Tackles
- Passes
- Tries scored

Tackles (Table 1-3)

The average number of tackles per game was similar between the 10m and 5m rules at 123 and 110 tackles per game respectively (P=0.528).

Table 1. Average tackles per game by rule and age

U14 5m rule	U15 5m rule	5m rule Total	U14 10m rule	U15 10m rule	10m rule Total
Tackles	Tackles	Tackles	Tackles	Tackles	Tackles
110	112	110	125	121	123

The number of passes that occurred prior to a completed tackle are outlined in Table 2. For example, for the 5m rule for u14 players there were on average 50 occasions where 1 pass was made before the player was tackled. Zero passes for a tackle indicates a run from dummy half without passing prior to being tackled.

No difference was determined for the number of passes per tackle for the 5 versus 10m rules (P=0.855). There were more passes per tackle for the U14 versus U15 age independent of the rule (P=0.034). There were a greater number of tackles where 0, 1 or 2 passes were thrown and a much lower rates of tackles where 3, 4 or 5 (or more) passes per tackle occurred (Table 2, P<0.001)

Table 2. Average number of passes per tackle

District / Age	Number of passes per tackle					
	0	1	2	3	4	5+
5m rule U/14	38	50	13	7	3	1
5m rule U/15	29	42	21	6	1	1
5m rule TOTAL	28	46	14	6	2	1
10m rule U/14	37	56	27	6	2	1
10m rule U/15	30	40	19	6	1	1
10m rule TOTAL	33	47	22	6	2	1

Rounded to nearest whole number

No difference was seen between the 5 and 10m rule for numbers of players in the tackle (P=0.807). There were more in a tackle for the U14 versus U15 age group (P=0.031), There were more tackles with a lower number of players in the tackle for both the 5 and 10m rules (P=0.005). In both rules there are effectively no tackles with five-or-more tacklers in them (Table 3).

Table 3. Average number of players in tackle

District / Age	Number of players in tackle				
	1	2	3	4	5+
5m rule U/14	38.5	52.5	17.9	2.5	0.1
5m rule U/15	30.9	51.1	17.0	1.4	0.0
5m rule TOTAL	34.7	51.8	17.4	1.9	0.1
10m rule U/14	35.8	59.7	26.0	6.0	0.5
10m rule U/15	22.7	40.6	26.1	5.4	0.9
10m rule TOTAL	28.8	49.4	26.1	5.7	0.7

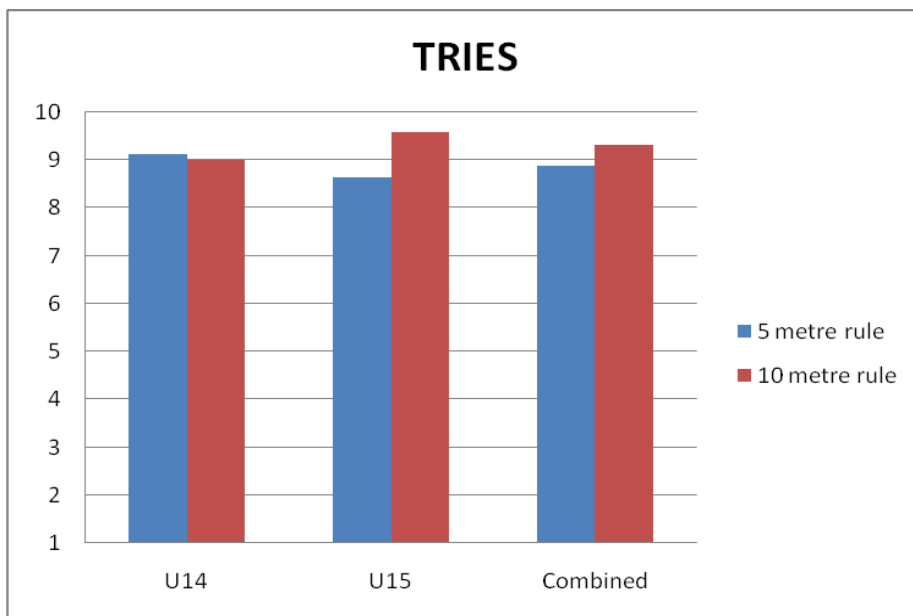
Tries scored (Table 4 – 7)

Total tries scored per game when collapsed by 5 versus 10m rule are very similar at approximately 9 tires per game (Table 4 and Graph 1).

Table 4. Total tries per rule/age

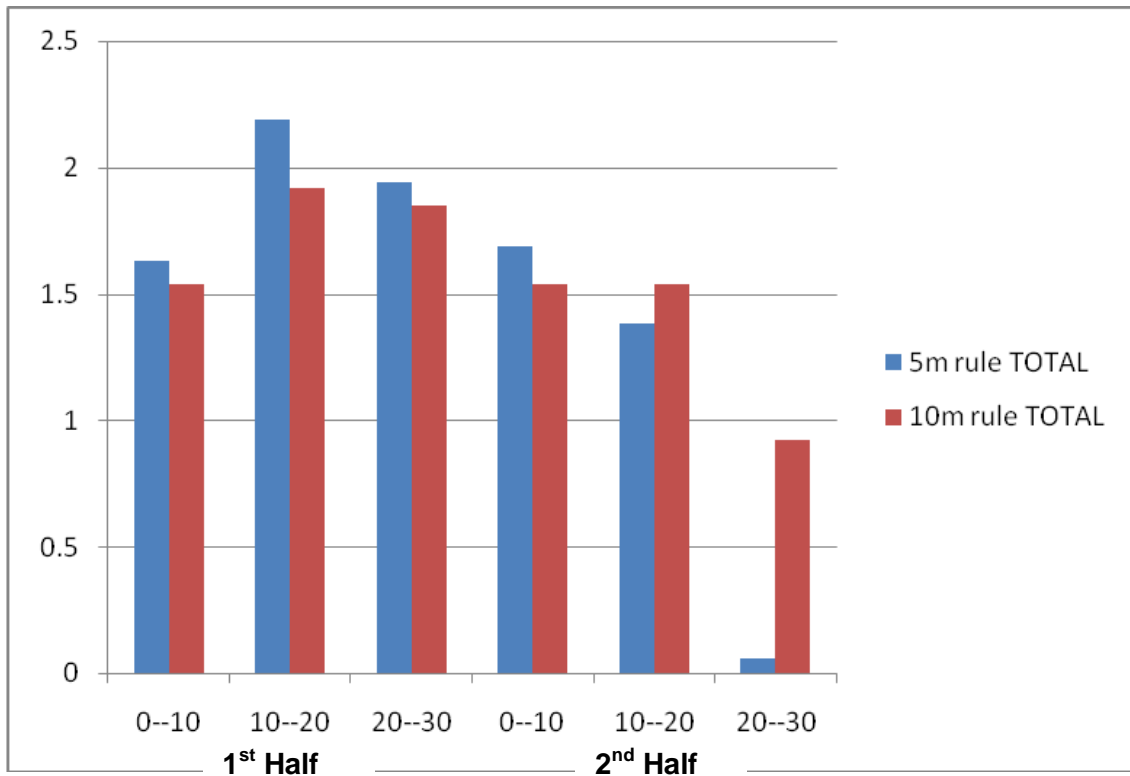
U14 5m rule	U15 5m rule	5m rule Total	U14 10m rule	U15 10m rule	10m rule Total
Tries (Games)	Tries (Games)	Tries (Games)	Tries (Games)	Tries (Games)	Tries (Games)
73 (8)	69 (8)	142 (16)	54 (6)	67 (7)	121 (13)

Graph 1. Average tries per game



Under both rules, more tries were scored in the first versus second half (Graph 2). With most tries scored in the 10-30 minute period of the first half. The peak period for scoring tries for both rules occurred in the 10-20 minute period of the first half. There was then a reduction in the number of tries scored during the game with the least number of tries being scored in the final 10 minutes of the game. On average, there were effectively no tries scored in the final 10 minutes of the game for the 5m rule and around one try in the last 10 minutes for the 10m rule.

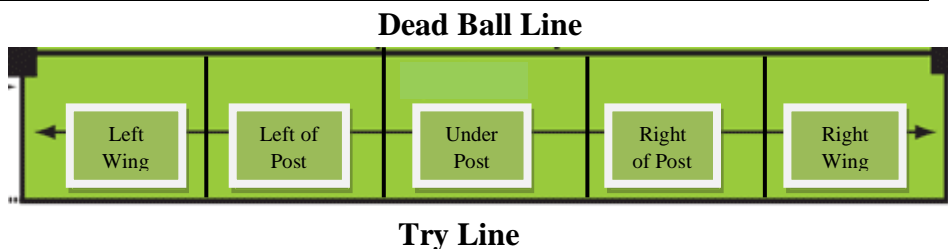
Graph 2. When in game tries were scored (Average per game)



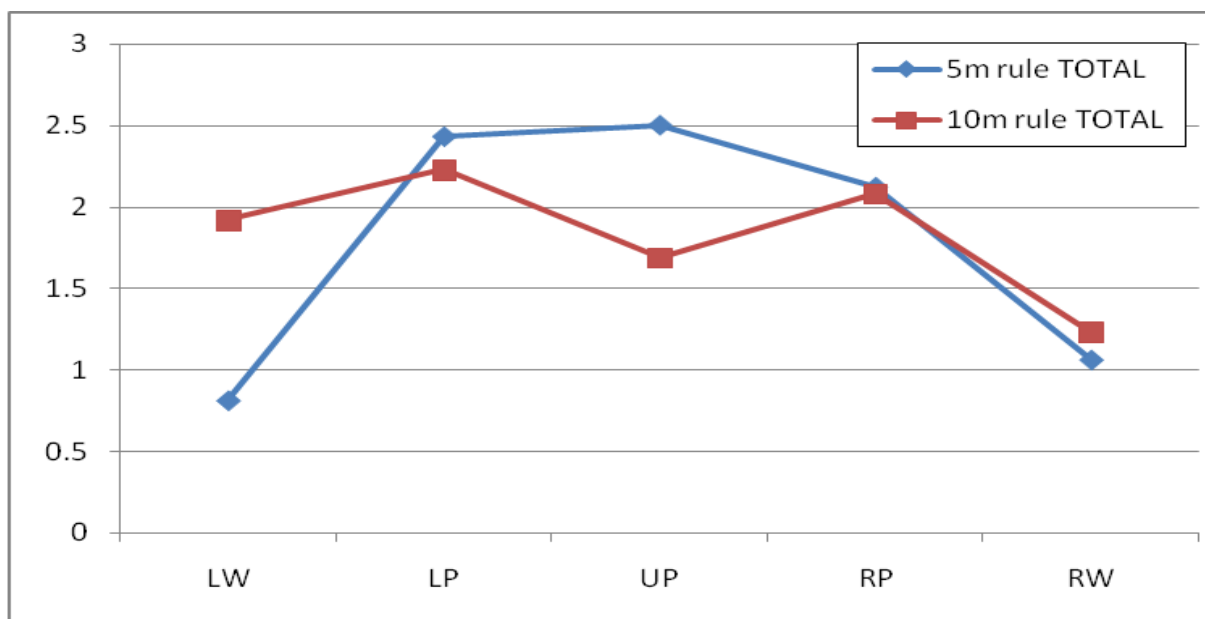
With the tryline divided into 5 equal segments the majority of tries (2-2.5 per game) were scored in the centre 60% for the 5m rule and 1 try per game for each wing. For the 10m rule there was a more even distribution of tries for the left wing and and centre 60% of the field at approximately 2 tries per segment and 1 try per game for the right wing. This data may have smoothed if more games were coded.

Table 5. Where on field scored

District / Age	Position of try scored on field				
	LW	LP	UP	RP	RW
5m rule U/14	1.0	1.8	3.0	2.4	0.9
5m rule U/15	0.6	3.1	2.0	1.9	1.3
5m rule TOTAL	0.8	2.4	2.5	2.1	1.1
10m rule U/14	1.7	2.2	1.0	2.2	2.0
10m rule U/15	2.1	2.3	2.3	2.0	0.6
10m rule TOTAL	1.9	2.2	1.7	2.1	1.2



Graph 3. Where on field scored

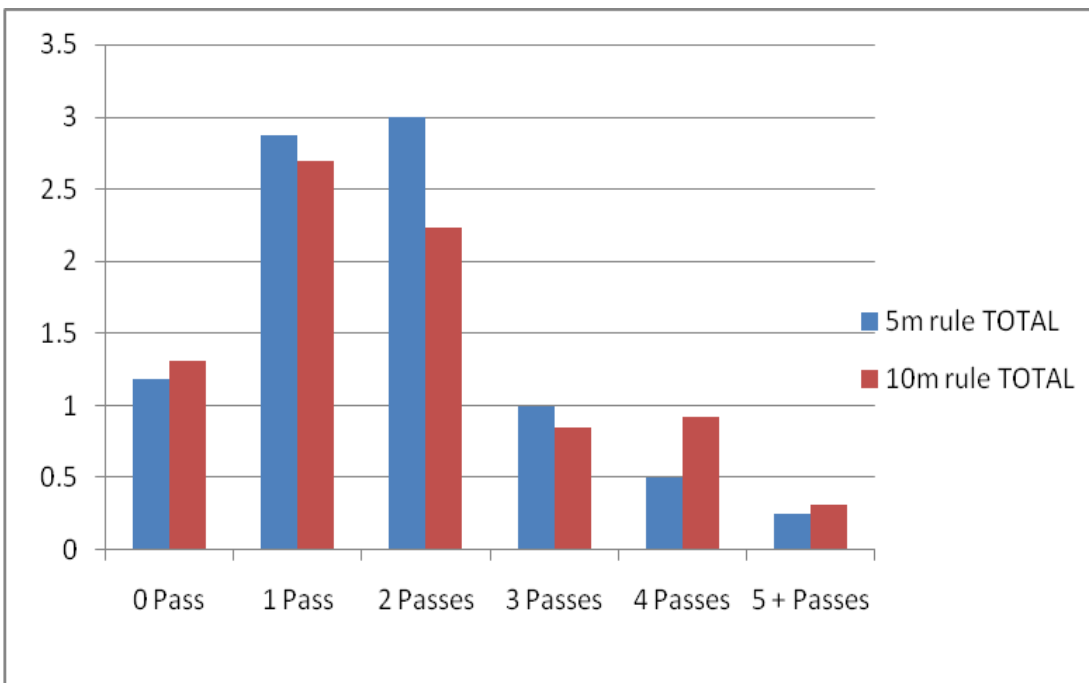


Both rules showed a similar distribution of the number of passes in a try scoring move with most try scoring moves containing one or two passes (Table 6). In the 5m rule there were an average of three tries per game scored from a 2-pass move versus 2 tries per game for the 10m rule (Graph 4).

Table 6. Average number of tries scored per game against number of passes leading to the try

District / Age	Average Number of passes before try scored					
	0 Pass	1 Pass	2 Passes	3 Passes	4 Passes	5 + Passes
5m rule U/14	1.3	3.0	2.4	1.4	0.5	0.5
5m rule U/15	1.1	2.8	3.6	0.6	0.5	0.0
5m rule TOTAL	1.2	2.9	3.0	1.0	0.5	0.3
10m rule U/14	1.5	3.0	1.8	1.8	0.5	0.3
10m rule U/15	1.1	2.4	2.6	0.0	1.3	0.3
10m rule TOTAL	1.3	2.7	2.2	0.9	0.9	0.3

Graph 4. Average number of tries scored per game against number of passes leading to the try



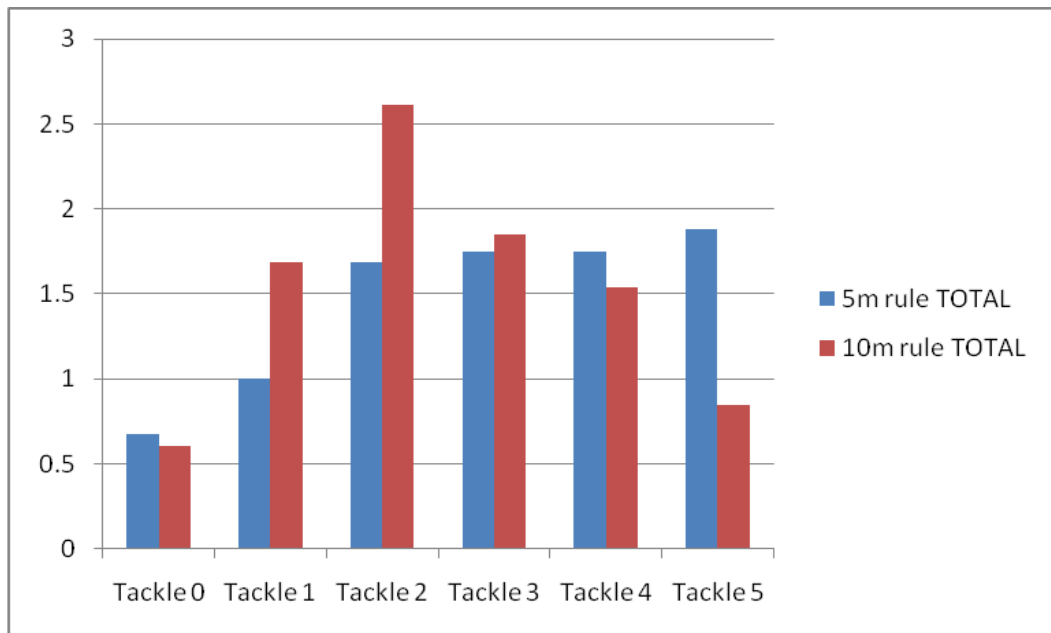
For the 10m rule more tries were scored on Tackle 2 than any other tackle with 2.5 tries per game being scored on the second tackle. For the 5m rule there was a more even distribution with a similar number of

tries being scored of Tackles 2, 3, 4 and 5 (Table 7). The 5m rule had double the number of tries scored on the fifth tackle when compared to the 10m rule (Graph 5). In both rules the least number of tries occurred on tackle zero which is reasonable as there are a low number of tackle zeros in a game.

Table 7. Number of tries by tackle count

District / Age	Average number of tries by tackle count					
	Tackle 0	Tackle 1	Tackle 2	Tackle 3	Tackle 4	Tackle 5
5m rule U/14	0.4	1.5	1.4	1.8	2.3	1.8
5m rule U/15	1.0	0.5	2.0	1.8	1.4	2.0
5m rule TOTAL	0.7	1.0	1.7	1.8	1.8	1.9
10m rule U/14	0.3	1.7	2.3	1.5	2.3	0.8
10m rule U/15	0.9	1.7	2.9	2.1	0.9	0.9
10m rule TOTAL	0.6	1.7	2.6	1.9	1.5	0.9

Graph 5. Number of tries by tackle count



Summary

The results indicate that a number of the game statistics were similar for the 5 and 10m rules. The average number of tackles per game was similar between the 10m and 5m rules at 123 and 110 tackles per game respectively ($P=0.528$).

No difference was seen between the 5 and 10m rule for numbers of players in the tackle and, as may be expected there were more tackles with a lower number of players in the tackle for both the 5 and 10m rules. On average there were more players in a tackle in the U14 versus the U15 age group.

No difference was determined for the average number of passes per tackle for the 5 versus 10m rule. We did observe more passes per tackle for the U14 versus U15 age group and a greater number of tackles where 0, 1 or 2 passes were thrown.

The total number of tries scored per game for 5 and 10m rule were also similar with both groups scoring around 9 tries per game. Under both rules, more tries were scored in the first half versus the second half. The peak period for scoring tries for both rules was in the 10-20 minute period of the first half. No tries were scored in the final 10 minutes of the game for the 5m rule and approximately one try per game was scored in the last 10 minutes for the 10m rule.

When looking at where tries were scored we saw the majority of tries being scored in the centre 60% of the field for the 5m rule. For the 10m rule there was a more even distribution of tries for the left wing and centre 60% of the field versus the right wing. For both the 5 and 10m rule most try scoring moves contained one or two passes. For the 10m rule more tries were scored on tackle 2 than any other tackle. The 5m rule had double the number of tries scored on the fifth tackle when compared to the 10m rule.

Overall there appeared to be no difference between the 5 v 10 m rule for tries scored, players in tackle and number of passes per tackle. Most differences observed in this study were between the age groups with more passes per tackle and more players in a tackle for the U14 group.

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