A Characterization of Hand and Wrist Injuries and Associated Risk Factors in National Basketball Association Athletes

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Hand and wrist function is essential to basketball ability, however injuries to the hand and wrist are not well-characterized in National Basketball Association (NBA) players. Factors associated with overall player efficiency after hand and wrist injuries also have not been evaluated in NBA players. The primary purpose of this study is to characterize the nature of ingame hand and wrist injuries in the NBA players. The secondary purpose is to analyze the factors associated with equal or increased player performance, measured by player efficiency rating (PER) and true shooting percentage (TS%), two years after sustaining a hand and wrist injury.

METHODS:

Injury data from seasons 2015-16 to 2020-21, with exclusion of the 2020-21 due to abbreviated COVID-19 play, was retrieved and extracted from a public online database, Pro Sports Transactions. Injury characteristics and NBA player demographic information were assessed utilizing descriptive statistics. Multivariable logistic regression analyses were performed to identify risk factors associated with equal or increased PER and TS% two years after injury. RESULTS:

There were 214 reported hand and wrist injuries, and of these injuries 173 (81%) were classified as structural. The most common injury types were a strain or sprain (0.63 per 1000 GEs), followed by fractures (0.37 per 1000 GEs). In poisson regression models, older age (RR, 0.89 [95% CI, 0.84-0.95]) and more years in NBA played were modestly associated with relative risk of having a decreased PER at 2 years after injury. Increased weight (RR, 1.02 [95% CI, 1 – 1.05]) and increased BMI (RR, 1.14 [95% CI, 1.01 – 1.29]) were also modestly associated with having a decreased PER and TS%, respectively at two years after injury.

DISCUSSION AND CONCLUSION:

Strains/sprains and fractures are the two most common hand and wrist injuries sustained by NBA players. NBA players sustaining hand and wrist injuries, regardless of dominant or nondominant hand and wrist, are likely to return to baseline overall player efficiency based on PER and TS% within two years of injury.

/er en	riciency d	ased	on PEF	1 1	and	13	5%	withi	n	two	у	ears
Table 1. Injury Characteristics		Table 2. Player Characteristics		Table 3. Associations with having an equal or higher player efficiency rating (PER) at 2 years			Table 4. Associations with having an equal or higher true shooting percentage (TS%) at 2 years					
		261(41)		PER at 2 years < Baseline (N=50)	PER at 2 year >= Baseline (N=40)	Relative Risk (RR)	p value		TS% at 2 years < Baseline (N=40)	TS% at 2 year >= Baseline (N=49)	Relative Risk (RR)	p value
	Median (O1, O3)	25.0 (23.0, 29.0)	Position					Position				
	Height	abio (abio, abio)	Center	10 (20.0%)	9 (22.5%)	reference	reference	Center	9 (22.5%)	10 (20.4%)	reference	reference
140 (65.4%)	Mean (SD)	2.0 (0.1)	Forward	11 (22.076)	4 (10.076)	0.5(0.19 * 1.28)	0.140	Forward	7 (17.3%)	7 (14.3%)	0.88(0.45 - 1.72)	0.714
	Median (O1, O3)	2.0 (2.0, 2.1)	Point Guard	11 (22.0%)	4 (10.0%)	0.46(0.19 - 1.14	0.094	Point Guard	6 (15.0%)	9 (18.4%)	0.85(0.49 - 1.48)	0.569
	Weight		Small Forwar	3 7 (14.0%)	13 (32.5%)	1.01(0.52 - 1.97	0.969	Small Forward	9 (22.5%)	11 (22.4%)	0.88(0.51 - 1.51)	0.642
33 (15.4%)	Mean (SD)	100.5 (11.2)	Guard	11 (22.0%)	10 (25.0%)	0.72(0.33 - 1.56	0.402	Shooting Guard	9 (22.5%)	12 (24.5%)	0.85(0.51 - 1.44)	0.554
55 (15.170)	Median (O1_O3)	100.0 (92.0 108.0)	Age	28.0 (25.0, 31.0)	25.0 (23.0, 28.0)	0.89(0.84 - 0.95	<0.001	Age	27.0 (25.0, 30.2)	27.0 (23.0, 29.0)	0.96(0.92 - 1.01)	0.138
49 (22.9%)			Height	2.0 (1.9, 2.1)	2.0 (2.0, 2.1)	9.7(0.46 - 203.03)	0.143	Height	2.0 (2.0, 2.1)	2.0 (1.9, 2.1)	1.39(0.15 -	0.775
46 (21.5%)	BMI		Weight	99.5 (88.0,	101.0 (96.0,	1.02(1 - 1.05)	0.032	Weight	99.0 (91.0,	100.0 (95.0,	1.01(0.99 - 1.03)	0.194
06 (40 00/)	Mean (SD)	24.9 (1.7)		108.0)	108.2)				108.0)	111.0)		
86 (40.2%)	Median (Q1, Q3)	25.0 (23.8, 26.0)	BMI	25.0 (23.8, 26.1)	25.3 (24.7, 26.0)) 1.15(0.99 - 1.32	0.065	BMI	24.9 (23.8, 25.7)	25.6 (24.5, 26.2)	1.14(1.01 - 1.29)	0.036
	Year in NBA		Total Minute	\$ 27.2 (21.1.31.9)	4.0 (3.0, 7.2)	0.89(0.83 - 0.98	0.002	Total Minutes	27.2 (21.2, 32.0)	27.0 (20.3, 31.6)	1(0.95(0.9 - 1)	0.064
	Mean (SD)	5.8 (4.1)	Per Game	(2111, 5113)		1.01(0.00 - 1.00		Per Game	(21.2, 32.0)	27.0 (20.3, 31.0)	1(0.57 = 1.05)	0.935
16 (7.5%)	Median (Q1, Q3)	5.0 (2.0, 8.0)										
6 (2.8%)	Total Minutes Per Game		Dominant Sided Iniury	28 (56.0%)	26 (65.0%)	1.11(0.68 - 1.8)	0.673	Dominant Sided Inium	23 (57.5%)	31 (63.3%)	1(0.68 - 1.47)	0.988
0 (2.070)	Mean (SD)	23.6 (7.6)	Injury					Injury				
51 (23.8%)	Median (Q1, Q3)	23.5 (17.5, 30.1)	Location					Location				
5 (0.20/)	Hand		finger	7 (14.0%)	6 (15.0%)	reference	reference	finger	6 (15.0%)	7 (14.3%)	reference	reference
5 (2.5%)	Left	12 (7.8%)	hand	13 (26.0%)	13 (32.5%)	1.33(0.69 - 2.58	0.392	hand	12 (30.0%)	13 (26.5%)	1.04(0.56 - 1.93)	0.913
41 (19.2%)	Right	141 (92.2%)	lianto	5 (10.0%)	8 (20.0%)	0.95(0.45 = 2.05	0.501	wriat	9 (22.5%)	8 (10.376)	1.05(0.58 - 1.02)	0.515
06 (40,00()	Position								10 (081014)			
86 (40.2%)	Center	35 (22.9%)	wrist	21 (42.0%)	13 (32.5%)	0.79(0.39 - 1.61	0.519					
9 (4.2%)	Power Forward	28 (18.3%)						RRs from Zou	's Modified poisso	a regression model	s adjusted for base	line TS%. Value
15 (7.00())	Point Guard	28 (18.3%)	RRs from Zou's Modified poisson regression models adjusted for baseline PER. Values					are n(%) and n	tedian(IQR)			-
15 (7.0%)	Small Forward	28 (18.3%)	are n(%) and	nedian(IQR).								
	Shooting Guard	34 (22.2%)										
	Player Efficiency Rating											
	(PER)											
4.000 (2.000.	Mean (SD)	15.1 (5.0)										
	Median (Q1, Q3)	14.3 (11.9, 17.6)										
	(er) er) 140 (65.4%) 33 (15.4%) 33 (15.4%) 49 (22.9%) 46 (21.5%) 86 (40.2%) 16 (7.5%) 6 (2.8%) 51 (23.8%) 53 (23%) 41 (19.2%) 86 (40.2%) 9 (4.2%) 15 (7.0%) 4.000 (2.000,	Ball Ball 140 (65.4%) Mean (SD) 446 (21.5%) Mean (SD) 466 (21.5%) Mean (SD) 466 (21.5%) Mean (SD) 66 (2.8%) Mean (SD) 5 (2.3%) Mean (SD) 46 (21.5%) Mean (SD) Medam (Q1, Q2) Weight 16 (7.5%) Mean (SD) 5 (2.3%) Tatal Minutes Per Game 11 (19.2%) Mean (SD) 9 (4.2%) Pointion 2 (reter Power Forward 9 (4.2%) Point Gard 3 (15.400) Mean (SD) Medam (Q1, Q2) Mean (SD) Medam (Q1, Q3) Tatal Minutes Per Game Mean (SD) Medam (Q1, Q3) Batl Left Batl Power Forward Shooling Gaard Shooling Gaard Player Efficiency Rating Power Action Q Mean (SD) Mean (SD) Medam (Q1, Q3) Mean (SD) Medam (Q1, Q3) Mean (SD) Mean (SD) Mean (SD)	Ger Efficiency Dassed tics Table 2. Player Characteristics Table 2. Player Characteristics Table 2. 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