Spectrum of Occupational Injury Among Shoulder and Elbow Surgeons

Benjamin W. Sears, MD[1]; Libby A. Mauter, MSPT[1]; Brian P. Davis, MD; Hayden B. Schuette, DO[1]; Mallory A. Boyd, MS[1]; Armodios M. Hatzidakis, MD[1]

[1] Western Orthopaedics, HCA Rose Medical Center, Denver, CO;
[2]Boulder Centre for Orthopaedics & Spine, Broomfield, CO

Introduction

Orthopedic surgery is a physical occupation that can place surgeons at risk for acute or repetitive injuries. Although the incidence of occupational injury has been examined in general orthopedic surgeons, there is little data regarding occupational injuries among shoulder and elbow surgeons. The aim of this study is to quantify the rate and risk factors of occupational injuries among shoulder and elbow surgeons. Our hypothesis is that shoulder and elbow surgeons will have a prevalence of work-related injuries consistent with other orthopedic surgeons; however, surgeons with higher volume of arthroplasty will report more work-related injuries.

Methods and Materials

A formal electronic survey study was distributed to members of the American Shoulder and Elbow Society (ASES). This survey included 31 questions and was completed anonymously. Descriptive statistics were reported for all survey items. Statistical significance was evaluated using Chi-square and paired t.test statistics. Multiple regression analysis was conducted to determine if any demographic variables or practice characteristics were significant predictors of the most commonly reported injuries.

Results

The survey was completed by 210 shoulder and elbow surgeons and included 190 (90%) males and 20 (10%) females. Average time in practice was 21 years and 178 (85%) of responders were ASES members (57% at the Active or Associate level). Ninety-one responders (43%) reported working with residents while 72 (34%) work with fellows. A majority (114, 54%) performed 20-39 procedures per month and 87% utilized 2-3 days of clinic per week. In this cohort, 97% reported doing shoulder surgery and 83% utilized the beach chair position for arthroscopy.

There were 333 occupational injuries reported by 137 (65%) survey responders. Lumbar and cervical injuries were the most common (n=144) accounting for 34% of those described. The rate of cervical injuries (57% vs. 31%, p=.016) and symptomatic varicose veins (24% vs. 5%, p=.041) were significantly higher in female surgeons than males. There were also higher rates of wrist/hand/thumb injuries and symptomatic varicose veins reported in female surgeons but not reaching statistical significance (Table). A higher number of all injuries (cervical, lumbar, shoulder, elbow, wrist/hand/thumb, knee and symptomatic varicose veins) were reported to occur in shoulder and elbow surgeons between 30-40 years of age (Table). Occupational injuries resulted in 21 responders undergoing a total of 27 surgeries including wrist/hand/thumb (8), shoulder (7), lumbar (5), knee (3), cervical (2) and hernia or varicose veins (1 each).

Multiple regression analysis using gender, BMI, years in practice, percent of practice consisting of shoulder or elbow surgery and volume of shoulder arthroplasty as independent variables identified female gender as a significant predictor of developing a cervical injury (OR 4.39, p=0.011).

Discussion

This data demonstrates that among shoulder and elbow surgeons who completed this occupational health survey, there is a high incidence of work-related injuries associated with this profession with 65% of responders reporting at least one injury. Most injuries occurred when the surgeon was between the ages of 30 and 40 years. Female gender was predictive of cervical injury (p=0.011) and female surgeons reported higher rates wrist/hand/thumb, and symptomatic varicose veins than their male colleagues. Other than cervical injury in female surgeons, there was no clear correlation with one specific risk factor to the occupational injuries identified in this study. The data provide surgeons a baseline rationale for taking necessary precautions to protect themselves in the workplace, particularly for female surgeons and surgeons as they are starting in practice.

Table: Summary of Selected Occupational Injuries Reported by Respondents										
	Cervical Injury		**Lumbar Injury**		**Shoulder Injury**		**Wrist/hand/thumb**		**Varicose Veins**	
Gender	**N = 70**		**N=74**		**N=50**		**N=64**		**N = 14**	
Female, n (% of total female respondents)	12 (57%)	p=.016	7 (33%)	p>.99	3 (14%)	p=.486	9 (48%)	p=.219	4 (24%)	p=.041
Male, n (% of total male respondents)	58 (31%)		67 (35%)		47 (25%)		55 (29%)		10 (5%)	
Age now										
Mean (SD)	47 (10)		50 (11)		48 (10)		48 (10)		51 (11)	
Median (Min-Max)	47 (32-75)		49 (32-78)		47 (32-75)		46 (32-74)		50 (26-70)	
Age injury occurred										
30 to 40 years	40 (57%)		38 (51%)		30 (60%)		40 (63%)		10 (73%)	
41 to 50 years	28 (40%)		34 (46%)		19 (38%)		21 (33%)		3 (20%)	
51 to 55 years	2 (3%)		1 (1%)		1 (2%)		0 (0%)		1 (7%)	
over 60 years	0 (0%)		1 (1%)		0 (0%)		3 (5%)		0 (0%)	
Years in practice										
Mean (SD)	19 (10)		22 (11)		21 (11)		19 (11)		24 (11)	
Median (Min-Max)	19 (2-50)		21 (3-50)		20 (3-50)		(17, (5-46)		25 (9-44)	
Percent of practice in shoulder surgery										
Less than 30%	1 (2%)		3 (4%)		1 (2%)		1 (2%)		0 (0%)	
Less than 50%	4 (6%)		2 (3%)		3 (6%)		3 (5%)		1 (7%)	
More than 50%	17 (26%)		18 (26%)		16 (33%)		21 (33%)		5 (36%)	
More than 80%	44 (67%)		46 (67%)		28 (58%)		37 (60%)		7 (57%)	
Percent of practice in elbow surgery										
Less than 30%	56 (93%)		60 (95%)		39 (91%)		53 (88%)		12 (86%)	
Less than 50%	3 (5%)		2 (3%)		4 (9%)		6 (12%)		2 (14%)	
More than 50%	1 (2%)		1 (2%)		0 (0%)		0 (0%)		0 (0%)	
Average Procedure/mon										
> 10 procedures	2 (3%)		2 (3%)		1 (2%)		0 (0%)		0 (0%)	
10 to 19 procedures	8 (11%)		4 (5%)		6 (12%)		5 (8%)		2 (13%)	
20 to 29 procedures	13 (19%)		15 (20%)		13 (26%)		15 (23%)		3 (20%)	
30 to 39 procedures	23 (33%)		24 (32%)		10 (20%)		22 (34%)		2 (13%)	
40 to 49 procedures	13 (19%)		15 (20%)		10 (20%)		11 (18%)		5 (33%)	
Over 50 procedures	11 (16%)		14 (19%)		10 (20%)		11 (17%)		3 (20%)	