

Unfallrisikoanalyse Sportklettern

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Fragestellung:

Sportklettern wird, vor allem auch von Risikoanalysen moderner Versicherungsträger, immer noch als Risikosportart klassifiziert. Hierzu fehlen allerdings wesentliche Basisstudien und eine objektive Risikoanalyse. Untersuchung zum Risikoprofil von Indoor- und Wettkampfklettern konnten ein nur geringes Unfallrisiko dokumentieren, Studien zum Alpinklettern ein mäßiges Unfallrisiko. Zum Großteil wird Sportklettern jedoch am niedrigen Felsen, im sog. Klettergartenniveau, ausgeführt. Hierzu fehlte bis dato jegliche objektive Datenlage. Zur Quantifizierung des Unfallrisikos, zur Graduierung der Unfallschwere und zum Vergleich des 1000 Stunden Unfallrisikos mit anderen Sportarten ist hier eine exakte Differenzierung der Subtypen im Klettersport notwendig.

Methodik:

Akute Sportkletterunfälle, die zwischen den Jahren 2002 und 2006 aufgetreten waren, wurden retrospektiv durch einen Internetfragebogen erfasst. Es konnten insgesamt 1962 Bögen von Sportlern aus 14 Nationen gesammelt werden, 32 Bögen mussten aufgrund von methodischen Fehlern storniert werden. Alle Verletzungen wurden mittels NACA und UIAA-MedCom Score evaluiert sowie das relative Unfallrisiko bezogen auf 1000 Stunden Sportexpositionszeit ermittelt. Es wurde alle Unfälle erfasst die eine professionelle Therapie benötigten, UIAA Grad 1 Verletzungen wurden nicht erfasst.

Table 1 NACA-Score.

Patient Status	Score Level
Slight injury or illness. No acute medical intervention necessary.	1
Easy one to moderately heavy injury or illness. Further diagnostic examination needed, usually however no emergency medical measures	2
Heavy, but not life-threatening injury or illness, frequently emergency-medical measures locally	3
Heavy injury or illness, with which the short term development of a life threat cannot be excluded	4
acute vital (life threatening) danger	5
breath and/or cycle stop and/or reanimation	6
death	7

Table 2 UIAA-Score.

Patient Status	Score Level
slight injury or illness, no medical intervention necessary, self therapy	1
middle severe injury or illness, not life threatening, prolonged conservative or surgical therapy, outpatient therapy, doctors attendance within a short time frame (days), injury related work absence, heal without permanent damage	2
major injury or illness, not life threatening, stationary therapy, surgical intervention necessary, immediate doctors attendance necessary, injury related work absence, heal with or without permanent damage	3
acute mortal danger, polytrauma, immediate prehospital doctors attendance if possible, acute surgical intervention, outcome alive, permanent damage	4
acute mortal danger, polytrauma, immediate prehospital doctors attendance if possible, acute surgical intervention, outcome dead	5
immediate death	6

Table 3: Demographische Daten

	Total	Male	Female
number	1962 (100%)	1583 (80.7%)	375 (19.1%)
BMI	22.2 ± 2.0	22.6 ± 1.9	20.8 ± 1.9
age (yrs)	32.8 ± 9.4	33.2 ± 9.6	31.7 ± 8.5
climbing experience (yrs)	10.0 ± 7.5	10.6 ± 7.8	7.6 ± 5.8
difficulty level (metric)	7.0 ± 1.4	7.2 ± 1.4	6.3 ± 1.2
climbing time/week (hrs)	summer 10.2 ± 7.4 winter 3.7 ± 3.9	summer 10.4 ± 7.5 winter 3.9 ± 4.1	summer 9.0 ± 7.0 winter 2.9 ± 3.3
Injuries/1000h	0.20	0.19	0.23

Ergebnisse:

Eine Gesamtzahl von 1962 Kletterern berichteten über insgesamt 699 Verletzungen, was einer Verletzungsrate von 0,2 Verletzungen pro 1000 Stunden Sportausübung entspricht. Die meisten (74,4 %) der Verletzungen waren minder schwer entsprechend einem NACA-Score von NACA I oder NACA II. Die Verteilung der Verletzungen zwischen der oberen (42,6 %) und unteren (41,3 %) war annähernd gleichmäßig, wobei Bandverletzungen, Prellungen und Knochenbrüche die häufigsten Verletzungsarten darstellten. Jahre an Klettererfahrung ($p < 0,01$), Schwierigkeitsgrad ($p < 0,01$), durchschnittliche wöchentliche Kletterzeit während der Sommer-, ($p < 0,01$) und Wintermonate ($p < 0,01$) korrelierten mit der Verletzungsrate. Alter ($p < 0,05$ ($p = 0,034$)), Jahre an Klettererfahrung ($p < 0,01$) und der Schwierigkeitsgrad ($p < 0,01$) korrelierten mit der nach dem NACA-Score bewerteten Schwere der Verletzung. Das Risiko innerhalb von 1000 Stunden Sportausübung eine akute Verletzung zu erleiden war geringer als in bisherigen Studien zu allgemeinem Felsklettern und höher als in Studien zum Indoor-Klettern.

Abb 1: Verletzungen und anatomische Region

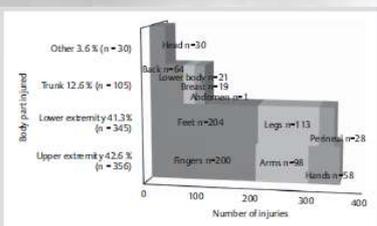
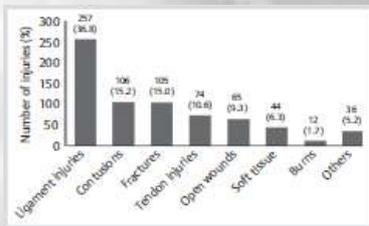


Abb 2: Verletzungsarten



Tab 4: Verletzungsschwere: NACA und UIAA Score

Type	Total in Injuries (%)	Total Injury rate (per 1000 h)
total	699 (100)	0.20
NACA I	252 (36.1)	0.07
NACA II	268 (38.3)	0.08
NACA III	172 (24.6)	0.05
NACA IV & V	7 (1)	0.002
NACA VI & VII	0	0

Type	Total in Injuries (%)	Total Injury rate (per 1000 h)
total	699 (100)	0.20
UIAA I	0 (0)	0
UIAA II	969 (81.4)	0.16
UIAA III	127 (18.2)	0.04
UIAA IV-V	3 (0.4)	0.001

Tab.5. Literaturvergleich

Study	Type of climbing (geographical location)	Injury rate (per 1000h)	Injury severity
[4]	Traditional climbing, including some rock walls 100m high (Yosemite Valley, CA, USA)	37.5*	majority of minor severity using ISS score <13; 5% ISS 13-15
[32]	Mountaineering and traditional climbing (Grand Tetons, WY, USA)	0.56 for injuries; 0.13 for fatalities; incidence 5.6 injuries/1000h of mountaineering	23% of the injuries were fatal
[30]	Indoor climbing walls (Germany)	0.079	3 NACA 2; 1 NACA 3; NACA 1-2*
[36]	Oversize injuries in indoor climbing at World Championship	NS	16 NACA 1; 1 NACA 2; 1 NACA 3; 208 no injury; 60% NACA 1; 20% >NACA 1
[26]	Indoor competition climbing, World Championships	3.1	2,871 (90%) NACA I; 1,211 (36%) NACA II; 1,113 (34%) NACA III; 113 (3%) NACA IV; 11 (0.3%) NACA V; 11 (0.3%) NACA VI; 11 (0.3%) NACA VII; 11 (0.3%) NACA VIII; 11 (0.3%) NACA IX; 11 (0.3%) NACA X; 11 (0.3%) NACA XI; 11 (0.3%) NACA XII; 11 (0.3%) NACA XIII; 11 (0.3%) NACA XIV; 11 (0.3%) NACA XV; 11 (0.3%) NACA XVI; 11 (0.3%) NACA XVII; 11 (0.3%) NACA XVIII; 11 (0.3%) NACA XIX; 11 (0.3%) NACA XX; 11 (0.3%) NACA XXI; 11 (0.3%) NACA XXII; 11 (0.3%) NACA XXIII; 11 (0.3%) NACA XXIV; 11 (0.3%) NACA XXV; 11 (0.3%) NACA XXVI; 11 (0.3%) NACA XXVII; 11 (0.3%) NACA XXVIII; 11 (0.3%) NACA XXIX; 11 (0.3%) NACA XXX; 11 (0.3%) NACA XXXI; 11 (0.3%) NACA XXXII; 11 (0.3%) NACA XXXIII; 11 (0.3%) NACA XXXIV; 11 (0.3%) NACA XXXV; 11 (0.3%) NACA XXXVI; 11 (0.3%) NACA XXXVII; 11 (0.3%) NACA XXXVIII; 11 (0.3%) NACA XXXIX; 11 (0.3%) NACA XXXX; 11 (0.3%) NACA XXXXI; 11 (0.3%) NACA XXXXII; 11 (0.3%) NACA XXXXIII; 11 (0.3%) NACA XXXXIV; 11 (0.3%) NACA XXXXV; 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