VIII GIORNATA DELLO SPECIALIZZANDO IN NEUROLOGIA

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## DOES ACUTE PERIPHERAL TRAUMA CONTRIBUTE TO IDIOPATHIC ADULT-

## **ONSET DYSTONIA?**

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# Background

• Head or central trauma associated with brain lesions is a wellrecognized cause of secondary dystonia

 By contrast, peripheral trauma, defined as trauma outside the central nervous system, is more controversial as a risk factor for idiopathic dystonia

# Peripherally-induced dystonia

 Involuntary, repetitive and patterned movement or abnormal posture triggered by trauma to peripheral nerve or soft tissue

Minor injuries associated with chronic repetitive movements or postures or with chronic changes in sensory stimuli in a body part

Acute peripheral injury

# Dystonia and minor injuries

Few controlled studies support

- working activities that require repetitive and accurate motor tasks as risk factor for occupational idiopatic dystonia in the upper limb
- disease of the anterior segment of the eye as a risk factor for idiopathic blepharospasm

## **TRAUMA AND DYSTONIA**



Mov Disord 2001

Controversy

Can Peripheral Trauma Induce Dystonia and Other Movement Disorders? Yes!

Joseph Jankovic, MD\*

Can Peripheral Trauma Induce Dystonia? No!

William J. Weiner, MD\*



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#### Does peripheral nerve injury induce dystonia?

#### (No)

—Giovanni Defazio, MD, Associate Professor of Neurology, Department of Neurological and Psychiatric Sciences, "Aldo Moro" University, Bari, Italy

#### (Yes)

—Joseph Jankovic, MD, Professor of Neurology, Director of Parkinson's Disease Center and Movement Disorders Clinic, Baylor College of Medicine, Houston, Texas, USA The relationship between acute peripheral trauma and subsequent movement disorder continues to be a source of debate

Institute of Neurology, University of Bari G Defazio V Lepore D Acquistapace P Livrea	Possible risk factors for primary adult onset dystonia: a case-control investigation by the Italian Movement Disorders Study Group
Department of Neurology, University of Rome A Berardelli Institute of Neurology, University of Genova C Abbruzzese	Giovanni Defazio, Alfredo Berardelli, Giovanni Abbruzzese, Vito Lepore, Vincenzo Coviello, Diomira Acquistapace, Livio Capus, Francesco Carella, Maria Teresa De Berardinis, Giuseppe Galardi, Paolo Girlanda, Silvio Maurri, Alberto Albanese, Laura Bertolasi, Rocco Liguori, Aroldo Rossi, Lucio Santoro, Gianni Tognoni, Paolo Livrea

Table 4	Conditional logistic	c univariate regres	sion analysi.	s relative to th	e variables tha	t reached significand	ce with primary
adult ons	et dystonia	-	-				

Risk factor	OR (95% CI)	p Value	+/+	-/+	+/-	_/_	2
Educational level (> 5th grade)	0.59 (0.37 to 0.97)	0.04	9	36	17	140	0
Hypertension	0.50 (0.28 to 0.88)	0.02	14	36	18	134	0
Head or face trauma with loss of consciousness	4 (1.12 to 14.3)	0.03	0	5	17	180	0
Neck or trunk trauma	→ 5.55 (1.20 to 25.0)	0.03	1	2	11	188	0
Eye diseases	3.3 (1.63 to 6.67)	0.002	7	11	34	151	0
Family history of tremor	8.5 (2.64 to 45.9)	< 0.001	1	2	23	176	0
Family history of dystonia	16 (2.4 to 682)	< 0.001	0	1	15	186	0

+/+ = case and control exposed; -/+ = control only; +/- = case only; -/- = neither exposed; ? = case-control pairs containing missing information.

Journal of neurology neurosurgery & psychiatry



Head trauma in primary cranial dystonias: a multicentre case-control study

Davide Martino, Giovanni Defazio, Giovanni Abbruzzese, Paolo Girlanda, Michele Tinazzi, Giovanni Fabbrini, Maria Stella Aniello, Laura Avanzino, Carlo Colosimo, Giuseppe Majorana, Carlo Trompetto, Alfredo Berardelli

J Neurol Neurosurg Psychiatry 2007;000:1-5. doi: 10.1136/jnnp.2006.103713

Table 3Logistic regression anbetween head trauma and cran	alysis o ial dyst	f the ass onia	ociation			
	OR	p Value	95% CI			
Vault or maxillofacial trauma (all) Vault trauma	1.19	0.49	0.73 to 1.93			
All traumas	1.17	0.58	0.66 to 2.08			
Traumas with loss of consciousness	0.89	0.8	0.36 to 2.21			
or skull tractures or both Maxillofacial trauma All traumas Traumas with facial wounds or	1.11	0.75 0.47	0.60 to 2.06 0.64 to 2.64	Study power > 90%		
maxillotacial bone tractures or both						
OR estimates were adjusted for age, sex	<, age at a	lisease on	set and years of			
Table 2 Frequent elapsed between t	cy distri rauma d	oution o and dise	f trauma in case ase onset	es and a	controls according	g to the time period
Time elapsed from	Time elapsed from Vault trauma*				Maxillofacial traum	a†
onset (years)	Cas	es (n = 17	7) (%) Controls (n =	217) (%)	Cases (n = 177) (%)	Controls (n = 217) (%)
≤ 1	2 (	.1)	3 (1.4)		2 (1.1)	3 (1.4)
1–5	4 (2	2.2)	4 (1.8)		1 (0.55)	4 (1.8)
>5	21	(11.9)	25 (11.5)		20 (11.3)	23 (10.6)
*Fisher's exact test = 1; †Fisher's exact test = 0.77.						



### Case-control study of writer's cramp

E. Roze,<sup>1,2</sup> A. Soumaré,<sup>3,4</sup> I. Pironneau,<sup>5</sup> S. Sangla,<sup>1</sup> V. Cochen de Cock,<sup>6</sup> A. Teixeira,<sup>1</sup> A. Astorquiza,<sup>7</sup> C. Bonnet,<sup>1</sup> J. P. Bleton,<sup>7,8</sup> M. Vidailhet<sup>1,9</sup> and A. Elbaz<sup>1,3,4</sup>

Characteristics	Cases n (%)	Controls n (%)	OR (95% CI) <sup>a</sup>	P <sup>a</sup>	
Trauma or disease of dominant upper limb <sup>c</sup>					
Trauma needing medical or nursing care	24 (23)	15 (14)	1.9 (0.9–4.0)	0.10	
Carpal tunnel syndrome	5 (5)	2 (2)	2.1 (0.4–11.7)	0.41	
Cervico-brachial neuralgia	7 (7)	3 (3)	1.2 (0.3–5.1)	0.81	
Tendinitis (elbow, shoulder)	8 (8)	1 (1)	5.7 (0.7-47.2)	0.11	
Other upper limb disorder <sup>d</sup>	11 (11)	9 (9)	1.0 (0.4–2.7)	0.98	

Jankovic diagnostic criteria for peripherallyinduced dystonia *Temporality and Plausability* 

- The injury must be severe enough to cause local symptoms of at least 2 weeks
- The onset of the dystonia should be within days up to 1 year after the injury
- The onset of the dystonia must be anatomically related to the site of injury

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ORIGINAL ARTICLE

# The Italian Dystonia Registry: rationale, design and preliminary findings

Giovanni Defazio<sup>1</sup> • M. Esposito<sup>2</sup> • G. Abbruzzese<sup>3</sup> • C. L. Scaglione<sup>4</sup> • G. Fabbrini<sup>5</sup> • G. Ferrazzano<sup>5</sup> • S. Peluso<sup>2</sup> • R. Pellicciari<sup>1</sup> • A. F. Gigante<sup>1</sup> • G. Cossu<sup>6</sup> • R. Arca<sup>6</sup> • L. Avanzino<sup>3</sup> • F. Bono<sup>7</sup> • M. R. Mazza<sup>7</sup> • L. Bertolasi<sup>8</sup> • R. Bacchin<sup>8</sup> • R. Eleopra<sup>9</sup> • C. Lettieri<sup>9</sup> • F. Morgante<sup>10</sup> • M. C. Altavista<sup>11</sup> • L. Polidori<sup>11</sup> • R. Liguori<sup>4</sup> • S. Misceo<sup>12</sup> • G. Squintani<sup>13</sup> • M. Tinazzi<sup>13</sup> • R. Ceravolo<sup>14</sup> • E. Unti<sup>14</sup> • L. Magistrelli<sup>15</sup> • M. Coletti Moja<sup>16</sup> • N. Modugno<sup>17</sup> • M. Petracca<sup>18</sup> • N. Tambasco<sup>19</sup> • M. S. Cotelli<sup>20</sup> • M. Aguggia<sup>21</sup> • A. Pisani<sup>22</sup> • M. Romano<sup>23</sup> • M. Zibetti<sup>24</sup> • A. R. Bentivoglio<sup>18</sup> • A. Albanese<sup>25</sup> • P. Girlanda<sup>10</sup> •



#### \*p<0.001 vs. secondary dystonia



# Acute peripheral injury in 1382 patients with idiopathic dystonia

	Upper limb	Lower limb	Neck-trunk
N. injuries	60	60	25
N. injuries occurring before dystonia onset	38	36	16
N. injuries occurring before dystonia onset and charged to the dystonic body part	5	0	9
N. injuries occurring 1 year before dystonia onset or less and charged to the dystonic body part (n. patients)	1	0	5 (4 patients)

# Acute peripheral injury in 200 patients with secondary dystonia

	Upper limb	Lower limb	Neck-trunk
N. injuries	4	6	4
N. injuries occurring before dystonia onset	3	5	0
N. injuries occurring before dystonia onset and charged to the dystonic body part	1	1	0
N. injuries occurring 1 year before dystonia onset or less and charged to the dystonic body part (n. patients)	0	0	0

# Demographic and clinical features

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Sex	Man	Woman	Woman	Woman	
Peripheral injury (site, age)	Upper limb, 25	Neck, 57	Neck, 43	Neck, 43	Neck, 53
Age of dystonia onset (years)	26	58	43	44	54
Dystonia at onset	Cervical dystonia	Cervical dystonia	Cervical dystonia	Cervical dystonia	Cervical dystonia
Spread to (time to spread)	Upper limb (3 months), larynx (2 years)	Upper limb (3 years)	None	None	None
Sensory trick	Yes	Yes	Yes	No	Yes
Dystonic tremor	No	Yes	No	No	No
Family history of dystonia	No	Mother and sister with cervical dystonia	No	No	No

# Conclusions

- Peripheral acute trauma is a controversial cause of dystonia in a small subset of patients
- The contribution of acute extracranial trauma to idiopathic dystonia, if any, is **negligible**
- These considerations may have **medical-forensic implications**

# **GRAZIE PER L'ATTENZIONE**

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