

ONLINE ONLY "DATA SUPPLEMENT"

Table 1 Cases' details (Details of cases presenting with different syndromes following an electrical injury including lightning)

Paper reference	Patient number	Age at shock (yrs.)	Age at onset (yrs.)	Sex	Entry point	Exit point	Delay	Site of onset	Diagnosis (as in papers)	Syndromes	Current strength
Gallagher & Talbert, 1991	1	29	33.5	M	N/A	N/A	4.5 yrs	N/A	MND	ALS/MND	20-25X10 ³ V
	2	30	32	M	N/A	N/A	2 yrs	N/A	MND	ALS/MND	120 V
	3	41	43	M	N/A	N/A	2 yrs	N/A	MND	ALS/MND	260 V
	4	19	22	M	N/A	N/A	3 yrs	N/A	MND	ALS/MND	120 V
	5	33	36	M	N/A	N/A	3 yrs	N/A	MND	ALS/MND	25,000 V
	6	20	32	M	N/A	N/A	12 yrs	N/A	MND	ALS/MND	10,000 V
	7	28	43	M	N/A	N/A	15 yrs	N/A	MND	ALS/MND	720 V
	8	20	36	M	N/A	N/A	16 yrs	N/A	MND	ALS/MND	220 V
	9	13	30	M	N/A	N/A	17 yrs	N/A	MND	ALS/MND	120 V
	10	13	31	M	N/A	N/A	18 yrs	N/A	MND	ALS/MND	240 V
	11	19	43	M	N/A	N/A	24 yrs	N/A	MND	ALS/MND	220 V
	12	7	37	M	N/A	N/A	30 yrs	N/A	MND	ALS/MND	20,000 V
	13	10	43	M	N/A	N/A	33 yrs	N/A	MND	ALS/MND	220 V
	14	7	41	M	N/A	N/A	34 yrs	N/A	MND	ALS/MND	120 V
	15	21	66	M	N/A	N/A	45 yrs	N/A	MND	ALS/MND	120 V
	16	20	33.5	M	N/A	N/A	13.5 yrs	N/A	MND	ALS/MND	High V
	17	20	42	M	N/A	N/A	22 yrs	N/A	MND	ALS/MND	High V
Farrell & Starr, 1968	1	65	67	M	UL	LL	2 yrs	LL	Neurogenic atrophy	NPS	18,000 V
Tashiro et al., 2000	1	70	72	M	UL	LL	2 yrs	UL	Motor neurone syndrome	NPS	20,000 V a.c.
Saddler & Thomas, 1990	1	69.99	70	F	N/A	N/A	2 days	Bulbar	Temporary bulbar palsy	NPS	N/A
Ghosh et al., 1995	1	22	34	M	UL	N/A	12 yrs	LL	Progressive MND	ALS/MND	440 V a.c.
Saha et al., 1981	1	39.92	40	M	UL	N/A	1 mth	LL	Primary lateral sclerosis	PUS	230 V a.c.
MND Database at IOP, London	1	22.83	23	M	UL	N/A	2 mths	UL	Clinically definite ALS	ALS/MND	N/A
Kanitkar & Roberts, 1988	1	18	18	M	Head	N/A	0.5 day	LL	Paraplegic with UMN sign	NPS	25,000 V a.c.
Bruegem et al., 1999	1	19.97	20	M	Head	LL	10 days	LL	Ascending paralysis leading on to tetraplegia	NPS	15,000 V a.c.
Koller & Orsagh, 1989	1	23.94	24	M	N/A	N/A	21 days	LL	Paraplegia (T12)	NPS	3,000 V d.c.
	2	27.99	28	M	N/A	N/A	5 days	LL	Paraparesis	NPS	3,000 V d.c.
	3	19.99	20	M	N/A	N/A	4 days	N/A	Quadriparalysis	NPS	25,000 V a.c.
	4	47.95	48	M	N/A	N/A	20 days	LL	Paraparesis	NPS	24,000 V a.c.
	5	19.99	20	M	N/A	N/A	5 days	LL	Paraparesis	NPS	25,000 V a.c.
Arevalo et al., 1999	1	38.96	39	F	N/A	N/A	2 wks.	UL	Cervical myelopathy	NPS	20,000 V
	2	14.98	15	M	LL	N/A	6 days	N/A	Pyramidal and posterior cord involvement	NPS	10,000 V
Bariar et al., 2002	1	40	40	M	LL	N/A	1 day	LL	Pyramidal signs and weakness in LL	NPS	N/A
Varghese et al., 1986	1	18.99	19	M	Head	LL	2 days	LL	Spastic paraplegia	NPS	34,000 V
	2	65.98	66	M	UL	UL	7 days	LL	Quadriparalysis at C-7	NPS	N/A
	3	24.92	25	F	N/A	N/A	4 weeks	LL	Weakness in lower extremities	NPS	N/A
	4	65.98	66	M	LL	N/A	1 week	LL	Spastic paraparesis	NPS	N/A
	5	31.96	32	M	N/A	N/A	2 wks.	N/A	Weakness below C-7	NPS	N/A
Christensen et al., 1980	1	21.99	22	F	UL	Head	5 days	N/A	Paraplegia progressing to quadriplegia	NPS	7,200 V
Sharma & Smith, 1978	1	25	25	M	N/A	N/A	1.5 days	LL	Paraplegic (pyramidal)	NPS	N/A
Holbrook et al., 1970	1	22.98	23	M	UL	N/A	8 days	LL	Spastic paraparesis leading on to quadriparalysis	NPS	33,000 V
Ratnayke et al., 1996	1	22.92	23	M	N/A	N/A	4 wks.	UL	Paresis of left arm and both legs	NPS	20,000 V
Jackson et al., 1964	1	10	10	M	UL	LL	0	N/A	Flaccid and areflexic quadriparalysis	NPS	75,000V
Allan, 1969	1	61	61	M	N/A	N/A	0	UL	Spasticity of right arm with absent UL reflexes	NPS	240 V a.c.
Kalita et al., 2002	1	30	30	F	UL	N/A	1 day	LL	Spastic paraparesis	NPS	11,000 V a.c.
Levine et al., 1975	1	34.99	35	M	Head	LL	2 days	LL	Transverse myelitis	NPS	High V
	2	21.83	22	M	UL	UL	2 mths.	LL	Weakness with hyperreflexia	NPS	2,200 V
Deveci et al., 2001	1	20.94	21	M	Head	N/A	3 wks.	N/A	Clonus	NPS	N/A
	2	14.94	15	M	UL	LL	3 wks.	LL	Clonus	NPS	20,000 V
	3	20.94	21	M	UL	LL	3 wks.	N/A	Clonus	NPS	18,000 V
	4	20.94	21	M	UL	N/A	3 wks.	N/A	Clonus	NPS	High V
Vincent FM, 1981	1	25.88	26	M	Head	LL	6 wks	N/A	ALS like syndrome	ALS/MND	3,200 V a.c.
So & Lee, 1973	1	49	49	M	UL	N/A	0.5 day	UL	ALS like syndrome	NPS	220 V a.c.
Low, 1976	1	24	26	M	UL	N/A	2 yrs	UL	Progressive spinal atrophy	ALS/MND	220 V
Sirdofsky et al., 1991	1	41.96	42	M	UL	LL	2 wks.	UL	Progressive MND	ALS/MND	110 V a.c.
Jafari et al., 2001	1	55.5	56	M	UL	LL	6 mths	UL	Progressive LMN disease	PLS	N/A
	2	41.42	42	M	UL	N/A	7 mths	UL	Probable ALS (spinal)	ALS/MND	380 V d.c.
	3	67.97	68	M	UL	N/A	10 days	UL	ALS (spinal)	NPS	380 V

	4	48.67	50	M	UL	N/A	16 mths.	UL	Probable ALS (spinal)	ALS/MND	380 V
	5	23	26	M	LL	N/A	3 yrs	LL	Possible ALS (spinal)	ALS/MND	380 V
	6	49	67	F	UL	LL	18 yrs	N/A	Bulbar ALS (definite)	ALS/MND	N/A
Haynal & Regli, 1964	1	N/A	N/A	M	UL	UL	N/A	UL	ALS	ALS/MND	Mx over 3 yrs
	2	N/A	N/A	M	UL	UL	N/A	UL	ALS	PLS	220-240 V (Mx)
	3	N/A	N/A	M	UL	UL	N/A	UL	ALS	ALS/MND	380 V (Mx. over yrs.)
	4	N/A	N/A	M	UL	UL	N/A	Bulbar	ALS	PLS	220 V(Mx. over yrs.)
	5	N/A	N/A	M	UL	UL	N/A	UL	ALS	ALS/MND	220-380 V(Mx over 10 yrs)
	6	N/A	N/A	M	UL	UL	N/A	Bulbar	ALS	ALS/MND	Minor (Mx. over yrs.)
	7	N/A	N/A	M	UL	UL	N/A	UL	ALS	ALS/MND	1 major and minor Mx.
	8	N/A	N/A	M	UL	UL	N/A	UL	ALS	ALS/MND	220-500 V (Mx. over yrs.)
	9	N/A	N/A	M	UL	UL	N/A	UL	ALS	PLS	220-300 V(Mx. over yrs.)
Hoehl, 1906	1	4.75	6	M	UL	N/A	1.25 yrs	UL	ALS	ALS/MND	220 V
Panse, 1975*	1(Buttiker)	55.92	56	M	UL	N/A	4 wks.	UL	ALS (<i>autopsy confirmed</i>)	ALS/MND	1,000 V d.c
	2(Panse)	23.17	24	M	UL	LL	10 mths	UL	ALS	ALS/MND	220 V a.c
	3(Karnosh)	38.92	39	M	N/A	N/A	4 wks.	LL	Bulbar signs and flaccid legs	NPS	1,300 V a.c
	4(Linck)	51.58	52	M	UL	N/A	5 mths	LL	ALS (<i>autopsy confirmed</i>)	ALS/MND	220 V
	5(Alexander)	41.75	42	M	Head	UL	3 mths	N/A	Nuclear atrophy and spasticity in all four limbs	NPS	13,800 V
	6(Hegglin)	40.83	41	M	UL	N/A	2 mths	LL	Severe ALS	ALS/MND	15,000 V a.c
	7(Zangger)	N/A	N/A	M	N/A	N/A	3 mths	N/A	Spastic amyotrophy	NPS	N/A
	8(Hyslop)	42.99	43	M	LL	N/A	3 days	UL	ALS	PLS	50-100 V
	9(Jenny)	N/A	N/A	M	Head	LL	N/A	LL	Spastic paraparesis with muscle atrophy	NPS	High Voltage
	10 (Paillas & Roger)	N/A	N/A	F	UL	LL	N/A	UL	ALS	ALS/MND	600 V
	11(Panse)	18.5	21	M	UL	N/A	2.5 yrs	UL	ALS	ALS/MND	220 V
	12 (Panse)	8	18	M	UL	LL	10 yrs	LL	ALS (slowly progressive)	ALS/MND	220 V
Panse, 1955*	1(Leys)	N/A	N/A	M	N/A	N/A	N/A	UL	Classical ALS	ALS/MND	N/A
	2(Caso)	52	53	M	Head	N/A	1 yr	UL	ALS	ALS/MND	N/A
	3 (Nistri)	51.75	52	M	Head	N/A	3 mths.	UL	ALS	ALS/MND	N/A
	4(Panse)	57.5	58	M	UL	N/A	6 mths.	UL	Progressive spinal muscular atrophy	PLS	N/A
Grossmann, 1947	1	N/A	N/A	M	UL	LL	N/A	N/A	Neurovegetative dystonie	NPS	500 V
	2	N/A	N/A	M	UL	LL	N/A	UL	Spinal lesion	NPS	150-250 V
	3	N/A	N/A	M	UL	LL	N/A	UL	Neuritis (cervicobrachialis)	NPS	500 V
	4	55.92	56	M	UL	LL	4 wks.	UL	Late consequence	NPS	380 V
	5	39	39	M	UL	UL	0	UL	Right arm neuritis	NPS	380 V
	6	N/A	N/A	M	N/A	N/A	N/A	N/A	Temporary muscle atrophy	NPS	N/A
	7	45.67	46	M	UL	UL	4 mths	UL	Spinal muscle atrophy	PLS	500 V
	8	N/A	N/A	M	UL	UL	N/A	LL	ALS (<i>autopsy confirmed</i>)	ALS/MND	15,000 V
	9	N/A	N/A	M	LL	LL	N/A	UL	Neurovegetative dystonie	NPS	15,000 V

Keys for Table 1

UL= Upper Limb
 LL= Lower Limb
 LMN= Lower Motor Neurone
 UMN= Upper Motor Neurone
 LP= Lumbar Puncture
 BR= Babinski Reflex
 EMG= Electromyography
 N/A= Not Available
 yrs= years
 mths= months
 wks= weeks
 a.c= alternating current
 Mx= Multiple shocks
 Current class: (1= <300 V; 2= 301-1000 V; 3= >1000 V; 4= lightning)
 IOP= Institute of Psychiatry

LoC= Loss of Consciousness following electrical injury
 Delay= Delay between electrical injury and the onset of a syndrome
 Entry point= Entry point of the current
 Exit point= Exit point of the current
 Site of onset= Site of onset of the syndrome
 Syndromes= Syndromes following electrical injury as according to our classification criteria
 PUS= Progressive UMN syndrome
 PLS= Progressive LMN syndrome
 NPS= Non-progressive syndrome
 ALS/MND= Amyotrophic Lateral Sclerosis/Motor Neurone Disease
 V= Volts
 d.c= direct current

*Cases described are Panse's own patients as well as those cited in his papers from world literature with authors' names as in brackets

Current class	Source of current	L.o.C	Comments/follow up/other information
3	TV tube	N/A	Thrown away after shock
1	Wall Outlet	N/A	Thrown away after shock
1	Water Heater	N/A	Thrown away after shock
1	Lamp Socket	N/A	N/A
3	TV Tube	N/A	Thrown 8 feet after shock
3	Power Line	N/A	Thrown away after shock
2	Electric Tool	N/A	Seized by current
1	Wall Outlet	N/A	Thrown away after shock
1	Bare Wire	N/A	No reaction
1	Wall Outlet	N/A	Thrown away after shock
1	Wall Outlet	N/A	Thrown away after shock
3	Electric Fence	N/A	Thrown away after shock
1	Wall Outlet	N/A	Thrown away 12 feet after shock
1	appl.cord	N/A	Thrown away after shock
1	Live Wiring	N/A	Mild shocks
N/A	Live Wiring	N/A	Mild shocks and thrown away
N/A	Live Wiring	N/A	Mostly no reaction
3	Electric Cable	No	3 yrs. after trauma, course unchanged
3	N/A	N/A	N/A
4	Lightning	Yes	Full recovery 36 days after the incident
2	Electric Wire	Yes	Progressive MND after static disability for 11 yrs.
1	Electric Wire	Yes	Dysarthria seen in addition to UMN signs
N/A	Live Wire	No	Rapidly progressed
3	Cable Wire	No	Gradual progressive recovery
3	Power Line	Yes	Full recovery in UL and partial recovery in LL
3	Cable Wire	N/A	Partial recovery
3	Cable Wire	N/A	Full recovery
3	Cable Wire	N/A	Full recovery
3	Cable Wire	N/A	Gradual recovery over 2 yrs.
3	Cable Wire	N/A	Full recovery
3	N/A	Yes	Slow neurological improvement
3	N/A	N/A	Slow neurological improvement
N/A	Tension Wire	Yes	Partial recovery
3	Power Line	N/A	Partial recovery
N/A	Power Line	N/A	Very good recovery seen
N/A	Power Line	N/A	Almost complete recovery
N/A	Power Line	N/A	Complete recovery
N/A	Power Line	N/A	Almost complete neurological recovery
3	High V wire	N/A	Recovery observed
4	Lightning	Yes	Partial recovery during follow up
3	Electric Cable	Yes	By 160 days could mobilise with two sticks
3	Power Cable	Yes	At 1 yr. follow up gradual recovery
3	Power Cable	N/A	Died 70 days post injury from respiratory failure
1	Mains Supply	Yes	Over 6 wks. improvement with residual deficits
3	Electric Wire	Yes	Recovery over 4 mths. with residual deficit
3	Power Line	No	Died 3 mths. post injury of complications
3	Power Line	Yes	Could walk with wide gait 6 mths. later
4	Lightning	Yes	Clonus persisted over 4 yrs. follow up
3	Wire	Yes	Clonus ceased after 1 yr.
3	Wire	N/A	Clonus persisted over 3 yrs. follow up
3	Wire	Yes	Clonus ceased after 1yr.
3	Power Line	Yes	Slight improvement with baclofen
1	Live Wire	Yes	A non-progressive disease 2 yrs after accident
1	Live Wire	No	N/A
1	House Circuit	Yes	Death occurred 33 mths. after electrical injury
4	Lightning	N/A	Stable after 3 yrs.
2	N/A	N/A	Slow progression after 3 yrs.
2	Cable Wire	N/A	Complete remission after 12 yrs.

2	Cable Wire	N/A	Slow progression
2	Cable Wire	N/A	Died of respiratory failure after 107mths.
4	Lightning	N/A	Died 26 mths. after onset
N/A	Electric Rail	N/A	Progressed over 2 yrs. (Neurogenic atrophy)
1	Wire	Yes	Progressed over 2 yrs. (Neurogenic atrophy)
2	Wire	N/A	Progressed over 2 yrs. (Bulbar signs seen)
1	Wire	N/A	Progressed over 2 yrs. (Bulbar signs observed)
2	Wire	No	Progressed over 2 yrs. (Neurogenic atrophy)
N/A	Wire	N/A	Progressed over 2 yrs. (Bulbar signs observed)
N/A	Wire	No	Rapid progression over 2 yrs. (Bulbar signs seen)
2	Wire	N/A	Rapid progression over 2 yrs.
2	Wire	N/A	Progressed over 2 yrs.
1	Power Line	N/A	Progressed over several yrs.
2	N/A	No	Death 7.5 yrs. after trauma
1	Socket	No	Completely helpless in 3 yrs.
3	N/A	Yes	Died 6 mths. after trauma
1	N/A	No	Death 4.5 yrs. afterwards
3	N/A	Yes	Died 1.5 yrs. or so afterwards
3	N/A	N/A	N/A
N/A	N/A	N/A	Totally paralysed 20 yrs. after trauma
1	Rail Line	No	Died 9 mths. after onset of disease
N/A	Electric Unit	Yes with fits	Progressive disease seen at 4 yrs. after the shock
2	N/A	No	N/A
1	Electric Wire	No	ALS in end stage 9 yrs after trauma
1	Electric Wire	Yes	Slowly progressive ALS even 20 yrs. after trauma
4	Lightning	Yes	End-stage ALS over 2.5 yrs. follow up
4	Lightning	Yes	Progressive over 2 yr. follow up
4	Lightning	Yes	Rapidly progressive over 3 yrs.
4	Lightning	No	Died 11 mths. after the trauma due to aspiration
2	Wire	Yes	No atrophy
1	Wire	Yes	Non-progressive and partially reversible
2	Wire	No	Non-progressive
2	Electromotor	No	Non-progressive
2	Wire	Yes	N/A
4	Lightning	Yes	N/A
2	Electromotor	No	Progressive with no UMN signs
3	Wire	No	Could not work at 2 mths. due to muscle wasting
3	Wire	No	Muscle biopsy showed degenerative changes