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1 3. 厚生労働科学研究費補助金の各研究推進事業に推薦する予定の研究者

年 度	外国人研究者招へい事業	外国への日本人研究者派遣事業	若手研究者育成活用事業 (リサーチ・レジデント)
平成25年度	0 名	0 名	0 名
平成26年度	0 名	0 名	0 名
平成27年度	0 名	0 名	0 名

平成25-27年度厚生労働科学研究費補助金事業

脳卒中急性期医療の地域格差の 可視化と縮小に関する研究 (J-ASPECT Study)

研究代表者

九州大学大学院 医学研究院 脳神経外科
飯原弘二

背景と目的

- 脳卒中の救急医療の整備は喫緊の課題である。
- 緊急性の高い脳卒中治療については、医療機関の集約化、広域化と連携強化は避けて通れない。
- 全国的な俯瞰した視点で、地域の脳卒中の救急医療の実態を調査し、脳卒中センターの適正な配備を策定することが必要である。

脳卒中救急疫学の確立を目指して (J-ASPECT Study)

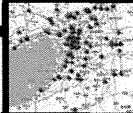
1. 包括的脳卒中センターの要件 (本邦での実態調査)



2. 脳卒中診療医の燃え尽き症候群、立ち去り型退職の実態調査



3. DPC情報を活用した大規模包括的脳卒中データベースの構築



4. GIS情報と医療機関情報(DPC)との連結

平成22-24年度 厚生労働科学研究費 (主任研究者 飯原弘二)
「包括的脳卒中センターの整備に向けた脳卒中の救急医療に関する研究」

包括的脳卒中センターの要件

(Comprehensive Stroke Center, Albers et al. Stroke 2005)

- Primary Stroke Centerの要件 (t-PA 静注療法)
+
- 脳卒中内科医、脳血管外科医などの専門家
- 高度な Neuroimaging、神経放射線科医
- 脳血管外科治療、急性期脳血管再開通療法
- 年間SAH治療 (クリッピング) > 20 (10)
- AVMなど高度な外科治療
- インフラ(集中治療室)、レジストリー
- リハビリテーション、ストロークナース

脳卒中診療施設調査 (平成23年2月)

- 目的: 脳卒中センターの機能 と 脳卒中治療件数
- 対象: 日本脳神経外科学会、神経学会、日本脳卒中学会研修教育施設 1369施設
- 調査項目:
 - 一次脳卒中センター (t-PA 静注療法の適正使用)の要件
 - t-PA protocolの整備 etc
- 包括的脳卒中センターの要件 (25項目)
 - 人的資源 (7): 専門医(脳外科 神経内科 血管内治療 救急) etc
 - 診断機器 (6): CT MRI -DWI 血管造影 etc 常時施行可能
 - 専門的治療 (5): 脳動脈瘤治療 脳内血腫除去 再開通療法 etc
 - インフラ (5): SCU ICU 手術・血管内治療 常時施行可能
 - 教育 (2): 院内外多職種、地域住民 対象

施設調査協力施設 (749施設、回答率 54%)

Variables	Category	n	%
No. of beds	<50	20	2.7
	50-99	30	4
	100-299	232	31
	300-499	260	34.7
	≥500	207	27.6
Annual stroke volume*	<50	51	7.2
	50-99	78	11
	100-199	199	28
	200-299	155	21.8
	≥300	228	32.1
Academic hospital		90	12
DPC hospital		553	73.8
Geographical locations	MEA-central	381	50.9
	MEA-outlying	239	31.9
	MeEA-central	90	12
	MeEA-outlying	12	1.6
	Unclassified	27	3.6
PSC component	t-PA protocol	637	85
	t-PA physician*	688	92
	NIHSS*	529	70.7
	Acute stroke team*	198	26.5
	Direct phone with EMS*	435	58.5

包括的脳卒中センターの推奨要件の充足率 (1)
— 人的要因、診断機器 —

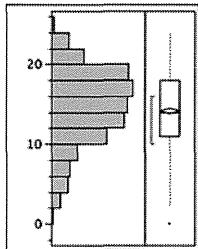
Components	Items	n	%
Personnel	Board-certified neurologist	358	47.8
	Board-certified neurosurgeon	694	92.7
	Endovascular physicians	272	36.3
	Critical care medicine	162	21.6
	Physical medicine and rehabilitation	113	15.1
	Rehabilitation therapy	742	99.1
	Stroke rehabilitation nurses*	102	13.8
Diagnostic (24/7)	CT*	742	99.2
	MRI with diffusion	647	86.4
	Digital cerebral angiography*	602	80.8
	CTA*	627	84
	Carotid duplex US*	257	34.5
	TCD*	121	16.2

包括的脳卒中センターの推奨要件の充足率 (2)
— 外科介入治療、インフラ、教育研究 —

Components	Items	n	%
Surgical	CEA*	603	80.6
	Clipping of intracranial aneurysm	685	91.5
	Hematoma removal/draining	689	92
	Coiling of intracranial aneurysm	360	48.1
	IA reperfusion therapy	498	66.5
Infrastructure	Stroke unit*	132	17.6
	ICU	445	59.4
	Operating rooms staffed 24/7*	451	60.4
	Interventional services coverage 24/7	279	37.3
Education	Stroke registry*	235	31.7
	Community education*	369	49.4
	Professional education*	436	58.6

CSC Score

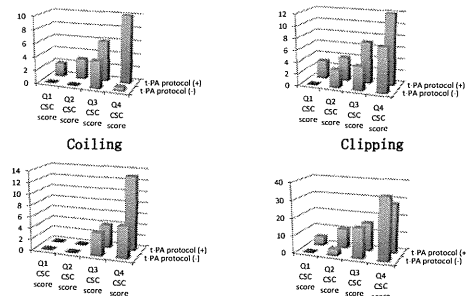
— Comprehensive Stroke Center Score —



- Median: 14
- IQR: 11-18
- Range: 0-24
- Q1: 0-11
- Q2: 12-14
- Q3: 15-17
- Q4: 18-24

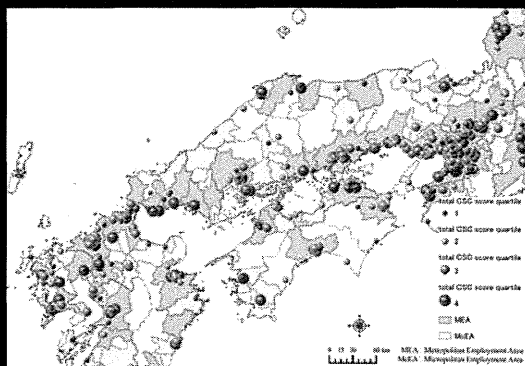
Case volume and Stroke care capacity (2009 Japan)

Case- t-PA infusion, ICH removal, clipping, coiling -
Stroke care capacity- t-PA protocol (PSC), CSC score -
t-PA infusion ICH removal



- 治療件数と脳卒中センター機能との間に相関
- CSC score (Q1-4) はすべての治療に相関、t-PA protocolはt-PA静注のみに相関

CSC Scoreに基づいた脳卒中治療の可視化
— Japanese Stroke Network —



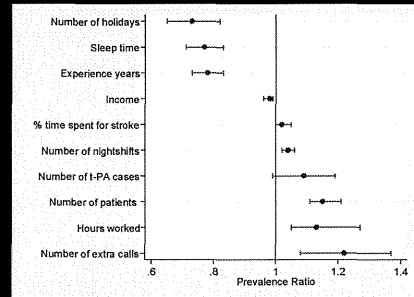
CSC Scoreに基づいた脳卒中治療ネットワークの可視化
— Japanese Stroke Network —



脳卒中診療医の勤務状況と疲労度調査 (平成23年5月)

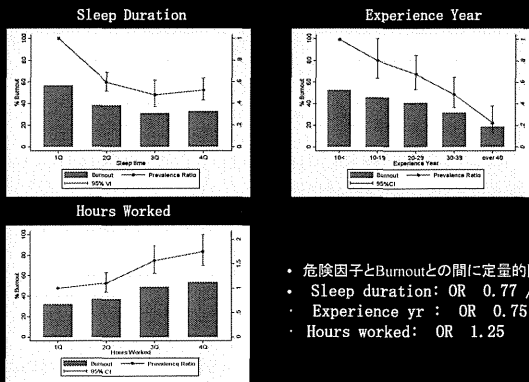
- 目的: 脳卒中治療に携わる医師のQuality of Life (QOL)、燃え尽き症候群の頻度を測定
- 対象: 日本脳神経外科学会専門医、日本神経学会専門医 10,741名 (震災の影響を考慮し、東北3県を除く全国調査)
- 方法: アンケート調査により、脳卒中治療に携わる医師のQOL、燃え尽き症候群の頻度を測定
- 疲労度の測定
 - 燃え尽き症候群: 日本版 MBI-GS を使用
 - QOL測定: SF-8(SF-36の短縮版) + MHI-5
- 背景因子
労働時間、睡眠時間、施設要因など合わせて評価

Age- and sex-adjusted predictors of Burnout



Predictors for burnout at 95% confidence intervals

Relationship between Burnout and Strong predictors (Predictors for burnout at 95% confidence intervals)



- 危険因子とBurnoutとの間に定量的関係
- Sleep duration: OR 0.77 / hr
- Experience yr : OR 0.75 / yr
- Hours worked: OR 1.25

脳卒中患者の退院調査 —DPC, 電子レセプト情報の活用— (平成23年、24年)

- 目的: 脳卒中治療の大規模データベースの作成と、ベンチマーキングの可能性
- 対象: 日本脳神経外科学会、日本神経学会教育訓練施設の中で、脳卒中診療施設調査に参加した 749病院
- 方法: 前年度に治療した脳卒中症例を、ICD 10 codeで抽出
- 臨床指標の測定
 - アウトカム指標 (入院死亡率)、プロセス指標 など
- 診療施設調査データ (CSC Score)とアウトカムと関係
- 背景因子
 - 年齢、性、重症度、病院など合わせて評価
 - Hierarchical regression analysis

Demographics (脳卒中緊急入院 256病院 53,170例)

	Total (n=53,170)	Ischemic stroke (n=32,671)	Intracerebral hemorrhage (n=15,699)	Subarachnoid hemorrhage (n=4,934)
Male, n (%)	29,353 (55.2)	18,816 (57.6)	9,030 (57.5)	1,584 (32.1)
Age, yr mean ± SD	72.5 ± 13.1	74.4 ± 12.2	70.7 ± 13.5	64.7 ± 14.8
Hypertension, n (%)	39,918 (75.1)	22,531 (69.0)	13,281 (84.6)	4,229 (85.7)
Diabetes Mellitus, n (%)	13,725 (25.8)	9,318 (28.5)	3,278 (20.9)	1,174 (23.8)
Hyperlipidemia, n (%)	15,015 (28.2)	11,104 (34.0)	2,529 (16.1)	1,412 (28.6)
Smoking (n=4,484)	12,761 (24.0)	8,188 (25.1)	3,540 (22.5)	1,074 (21.8)
Japan Coma Scale				
0, n (%)	19,635 (36.9)	15,027 (46.0)	3,620 (23.1)	1,024 (20.8)
1-digit code, n (%)	19,371 (36.4)	12,375 (37.9)	5,934 (37.8)	1,117 (22.6)
2-digit code, n (%)	6,937 (13.0)	3,396 (10.4)	2,705 (17.2)	852 (17.3)
3-digit code, n (%)	7,227 (13.6)	1,873 (5.7)	3,440 (21.9)	1,941 (39.3)
Emergency admission by ambulance, n (%)	31,995 (60.2)	17,336 (53.1)	10,909 (69.5)	3,830 (77.6)

Demographics (脳卒中緊急入院 53,170例)

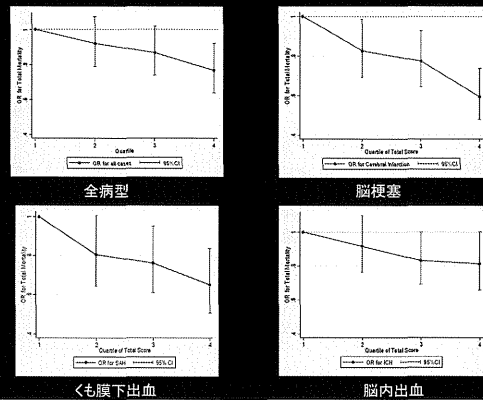
	Total (n=53,170)	Ischemic stroke (n=32,671)	Intracerebral hemorrhage (n=15,699)	Subarachnoid hemorrhage (n=4,934)
Hospital characteristics (CSC scores)				
Total score (25 items)		16.4 ± 3.7	16.6 ± 3.4	16.8 ± 3.2
Personnel with expertise (7 items)		3.7 ± 1.2	3.7 ± 1.2	3.8 ± 1.2
Diagnostic techniques (6 items)		4.4 ± 1.1	4.5 ± 1.0	4.5 ± 1.0
Surgical/interventional Tx (5 items)		4.4 ± 1.1	4.4 ± 1.0	4.5 ± 0.9
Infrastructure (5 items)		2.6 ± 1.1	2.6 ± 1.1	2.7 ± 1.1
Education/research (2 items)		1.4 ± 0.8	1.4 ± 0.8	1.4 ± 0.8

*病型による入院病院のCSC scoreには有意差なし

CSC Scoreの院内死亡への影響 (脳梗塞 緊急入院 32,671例)

Cerebral Infarction (adjusted by age, gender, and JCS)					
Factor	β	SE	OR	95%CI	P value
Male	0.2	0.05	1.23	1.12 - 1.35	<0.001
Age	0.34	0.02	1.4	1.34 - 1.47	<0.001
CSC total score	-0.03	0.01	0.97	0.96 - 0.99	0.001
JCS					
normal			1		
one-digit code	0.88	0.07	2.4	2.11 - 2.74	<0.001
two-digit code	2.01	0.07	7.46	6.47 - 8.60	<0.001
three-digit code	3.07	0.07	21.62	18.68 - 25.02	<0.001

院内総死亡に対するCSC Scoreの影響

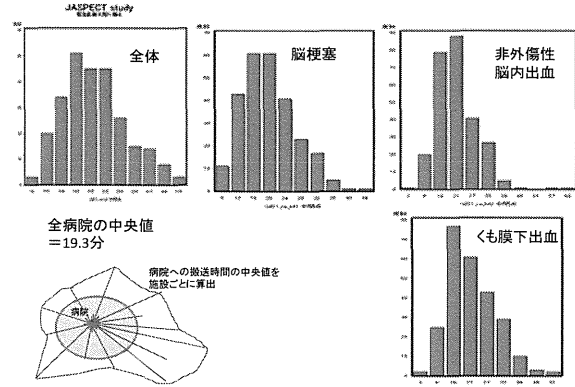


J-ACCESS Study

—GISの活用— (平成23年、24年)

- 目的: 脳卒中治療の大規模データベースを活用し、施設の脳卒中診療能力と、実効医療圏のサイズがアウトカムに与える影響を検証
- 対象:
 - 退院調査に参加した施設の脳卒中症例
 - 患者自宅と病院の郵便番号から、GISを用いて運転時間を計算
 - 運転時間の中央値で、実効医療圏を分類
 - CSC Scoreの中央値で、施設の脳卒中診療能力を分類
- アウトカム
 - 入院死亡率
- 背景因子
 - 年齢、性、重症度、病院など合わせて評価
 - Hierarchical regression analysis

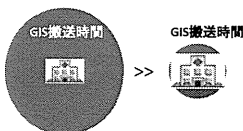
実効医療圏 (Catchment Area)



Hierarchical logistic regression analysis

脳梗塞	OR	95%CI	P value	脳内出血	OR	95%CI	P value
Sex	1.20	1.07-1.34	0.001	Sex	1.73	1.52-1.96	0.001
Age	1.34	1.27-1.42	<0.001	Age	1.34	1.28-1.41	<0.001
CSC score	0.97	0.95-0.99	<0.001	CSC score	0.96	0.93-0.98	<0.001
範囲大小	1.16	1.00-1.35	0.014	範囲大小	1.16	0.98-1.37	0.088
JCS4分類	2.56	2.43-2.71	<0.001	JCS4分類	6.33	5.80-6.91	<0.001
				病床数大小	1.10	1.00-1.22	0.042

脳卒中入院死亡率



くも膜下出血	OR	95%CI	P value
Sex	1.46	1.19-1.79	0.001
Age	1.37	1.29-1.46	<0.001
CSC score	0.91	0.91-0.97	<0.001
範囲大小	1.05	0.84-1.32	0.645
JCS4分類	5.09	4.36-5.81	<0.001

* 脳梗塞では、Catchment Areaが大きいかほど、死亡率が高い

平成24年度 J-ASPECT Study 退院患者調査 臨床指標速報値

2013年1月29日

データ対象病院

上段: H23年度
下段: H22年度
(データ年度)

速報値は、1月25日時点までに事務局に到着したデータのうち、データに不備がなかったDPCの入院データのみを対象になります。

調査対象	参加意向 返事	構成 比	参加 意向	1/28時点データ インポート完了	提出率	臨床指標 速報集計 使用		
757	返事 有り	360	48%	合計	344	299	87%	275病院 約5万2千症例
		407	54%		322	280	87%	258病院 約6万3千症例
	参加	344	45%	DPC 対象病院	299	262	88%	262
		322	43%	DPC 準備病院	282	254	90%	244
	不参加	16	2%	DPC 準備病院	16	13	81%	13
		85	11%	DPC調査 不参加病院	20	14	70%	14
返事無 し	397	52%	DPC調査 不参加病院	28	24	86%		
	350	46%	DPC調査 不参加病院	12	13	100%		

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平成24年度 J-ASPECT Study 退院患者調査 臨床指標速報値

2013年3月1日

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対象データ

データ 提出類型	DPC 調査	入院	外来
1	対象 病院	DPC調査データ 全月	EFファイル 全月
2			-
3	準備 病院	DPC調査データ 全月 (Dファイル除く)	EFファイル 全月
4			-
5	非参加 病院	電子レセプト データ 全月	-

平成23年4月～平成24年3月分

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データ対象病院

上段: H23年度
下段: H22年度
(データ年度)

速報値は、1月25日時点までに事務局に到着したデータのうち、データに不備がなかったDPCの入院データのみを対象になります。

調査対象	参加意向 返事	構成 比	参加 意向	1/28時点データ インポート完了	提出率	臨床指標 速報集計 使用		
757	返事 有り	360	48%	合計	344	299	87%	275病院 約5万2千症例
		407	54%		322	280	87%	258病院 約6万3千症例
	参加	344	45%	DPC/PDPS 対象病院	299	262	88%	262
		322	43%	DPC/PDPS 準備病院	282	254	90%	244
	不参加	16	2%	DPC/PDPS 準備病院	16	13	81%	13
		85	11%	DPC/PDPS 不参加病院	20	14	70%	14
返事無 し	397	52%	DPC/PDPS 不参加病院	28	24	86%		
	350	46%	DPC/PDPS 不参加病院	12	13	100%		

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臨床指標リスト 1

指 標	指標No.	
入院中の死亡割合	アウトカム-1	
入院から2時間以内の死亡割合	アウトカム-2	
入院から7日以内の死亡割合	アウトカム-3	
入院から30日以内の死亡割合	アウトカム-4	
外科治療、血管内治療から30日以内の死亡割合	アウトカム-5	
30日前後に退院した患者の退院時mRS	アウトカム-6	
全症例の退院時mRSスコア	アウトカム-7	
手術後30日以内の心臓梗塞の発生率	アウトカム-8	
手術後の脳梗塞の発生率	アウトカム-9 1~3	
院内感染肺炎発生率	アウトカム-10	
脳動脈ステント留置術の施行時の血栓防止器具使用の有無別死亡率	アウトカム-11	
初日	他院からの紹介入院割合	共通-1
到着	急性(入院)当日のCT、CTA、MRI、MRAの施行割合	共通-3
～2日目	VTE予防: 入院後2日以内に施行した割合	共通-5
～退院	脳血管疾患等リハビリテーションの施行割合	共通-6
～退院	早期経口中リハビリ施行割合(入院3日以内、入院2日以内)	共通-7
～退院	臓下尿管機能訓練の施行割合	共通-8
～退院	人工呼吸器使用平均日数	共通-9
～退院	各種加算の取得割合(救急医療管理加算、急性期病棟集中加算、看護協働型急性期入院加算、腫瘍加算、集中治療加算、SCC加算)	共通-12

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臨床指標リスト 2

指 標	指標No.	
～3日	7PA経注療法の実施割合	脳梗塞-2
～1日目	入院2日以内の褥瘡の予防実施割合	脳梗塞-3
～2日目	入院2日以内の褥瘡の予防実施割合	脳梗塞-4
～退院	旅行困難患者における入院後2日以内のDVT予防実施率	脳梗塞-5
～退院	6PAを必要とした患者の頭蓋内出血の割合	脳梗塞-8
～退院	退院時に心原性肺動脈血栓患者に対する低分子ヘパリン療法を施行した割合	脳梗塞-9
～退院	退院時に抗血小板薬を処方した割合	脳梗塞-10
～退院	退院時に脂質異常症患者に高脂血症治療を実施した割合	脳梗塞-11
～退院	退院時の抗血小板薬の適切な処方割合	脳梗塞-12
～退院	内頸動脈狭窄症患者における頸動脈血拴内腔閉塞術、経皮的頸動脈ステント留置術の実施割合	脳梗塞-15
～退院	経皮的脳血管形成術、経皮的選択的脳血栓溶解療法(頭蓋内、頭部脳血管)の実施割合	脳梗塞-16
～退院	経皮的脳血管形成術、経皮的選択的脳血栓溶解療法(頭蓋内、頭部脳血管)の実施割合	脳梗塞-17
～退院	頭蓋内外血管吻合術または脳梗塞血管形成術の実施割合	脳梗塞-18
～退院	発症日から2週間以内の頸動脈血拴内腔閉塞術または経皮的頸動脈ステント留置術の実施割合	脳梗塞-21

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臨床指標リスト 3

非	指	指標No
非外傷性 脳内血腫	抗凝固療法下の脳内出血におけるINR正常化治療の施行割合 脳内血腫除去手術の割合	非外傷性脳内血腫-1 脳内血腫除去手術-2
クモ膜下 出血	クモ膜下出血による意識障害の割合 脳血管造影下の脳動脈瘤治療後24時間以内の麻痺および14日までの麻痺割合 発症(入院)当日および14日までの経皮的脳動脈瘤治療の施行割合 減圧手術後、閉塞形成術の施行割合 木頭症手術、2センチメートル以上の基底節出血手術または動脈瘤治療の施行割合 脳動脈瘤造影治療の施行割合 重症用コイルの最大径	クモ膜下出血-3 クモ膜下出血-4 クモ膜下出血-5 クモ膜下出血-6 クモ膜下出血-7 クモ膜下出血-8 クモ膜下出血-9

期間別・疾患別死亡率

上段: H23年度
下段: H22年度
(データ年度)

3疾患 合計※	死亡者数(死亡率) 退院患者数	期 間				
		入院中	1日以内	7日以内	30日以内	術後30日以内
死亡者数(死亡率)	8,516(12.07%) 6,609(12.17%)	1,233(1.75%) 881(1.62%)	4,786(6.78%) 3,596(6.62%)	7,231(10.24%) 5,413(9.96%)	966(1.53%) 702(10.06%)	966(1.53%) 702(10.06%)
退院患者数	70,581 54,325	70,581 54,325	70,581 54,325	70,581 54,325	70,581 54,325	70,581 54,325
死亡者数(死亡率)	3,236(7.27%) 2,567(7.70%)	114(0.26%) 83(0.25%)	1,267(2.85%) 987(2.96%)	2,353(5.29%) 1,809(5.42%)	156(0.45%) 99(0.29%)	156(0.45%) 99(0.29%)
退院患者数	44,519 33,554	44,519 33,554	44,519 33,554	44,519 33,554	44,519 33,554	44,519 33,554
死亡者数(死亡率)	3,522(17.34%) 2,670(16.61%)	73(3.61%) 502(3.12%)	2,358(11.61%) 1,695(10.54%)	3,216(15.83%) 2,505(14.34%)	383(1.56%) 282(1.52%)	383(1.56%) 282(1.52%)
退院患者数	20,311 16,075	20,311 16,075	20,311 16,075	20,311 16,075	20,311 16,075	20,311 16,075
死亡者数(死亡率)	1,785(30.15%) 1,390(27.81%)	386(6.32%) 293(5.86%)	1,170(19.76%) 921(18.31%)	1,684(28.44%) 1,219(26.22%)	417(11.05%) 329(9.89%)	417(11.05%) 329(9.89%)
退院患者数	5,921 5,031	5,921 5,031	5,921 5,031	5,921 5,031	5,921 5,031	5,921 5,031

※複数の疾患にまたがる退院患者がいるため、疾患ごとの数字の積み上げは必ずしも「3疾患合計」と等しくならない。

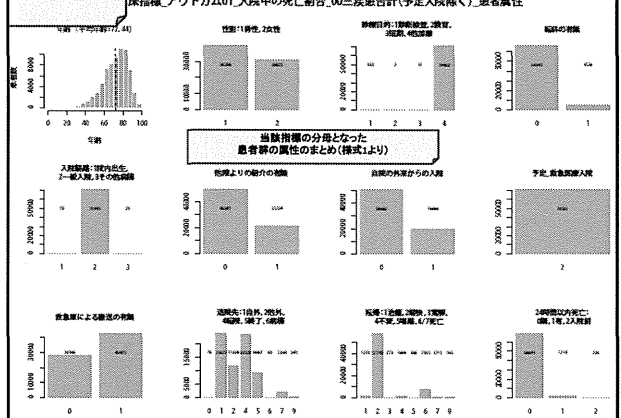
期間別・疾患別死亡率

上段: H23年度
下段: H22年度
(データ年度)

3疾患 合計※	死亡者数(死亡率) 退院患者数	期 間				
		入院中	1日以内	7日以内	30日以内	術後30日以内
死亡者数(死亡率)	9,310(10.48%) 7,319(10.52%)	1,292(1.45%) 931(1.34%)	5,076(5.72%) 3,851(5.53%)	7,764(8.74%) 5,868(8.43%)	1,025(1.11%) 758(0.69%)	1,025(1.11%) 758(0.69%)
退院患者数	88,810 69,589	88,810 69,589	88,810 69,589	88,810 69,589	88,810 69,589	88,810 69,589
死亡者数(死亡率)	3,737(6.37%) 2,587(6.64%)	123(0.21%) 96(0.21%)	1,390(2.37%) 1,074(2.39%)	2,648(4.52%) 2,027(4.51%)	177(0.35%) 112(0.94%)	177(0.35%) 112(0.94%)
退院患者数	58,637 44,971	58,637 44,971	58,637 44,971	58,637 44,971	58,637 44,971	58,637 44,971
死亡者数(死亡率)	3,732(15.73%) 2,862(15.05%)	765(3.23%) 528(2.78%)	2,470(10.44%) 1,801(9.47%)	3,377(14.24%) 2,454(12.91%)	396(1.31%) 306(1.70%)	396(1.31%) 306(1.70%)
退院患者数	23,718 19,013	23,718 19,013	23,718 19,013	23,718 19,013	23,718 19,013	23,718 19,013
死亡者数(死亡率)	1,870(28.08%) 1,498(25.93%)	405(6.08%) 308(5.33%)	1,222(18.35%) 983(17.02%)	1,763(26.48%) 1,407(24.36%)	462(11.65%) 349(9.59%)	462(11.65%) 349(9.59%)
退院患者数	6,659 5,777	6,659 5,777	6,659 5,777	6,659 5,777	6,659 5,777	6,659 5,777

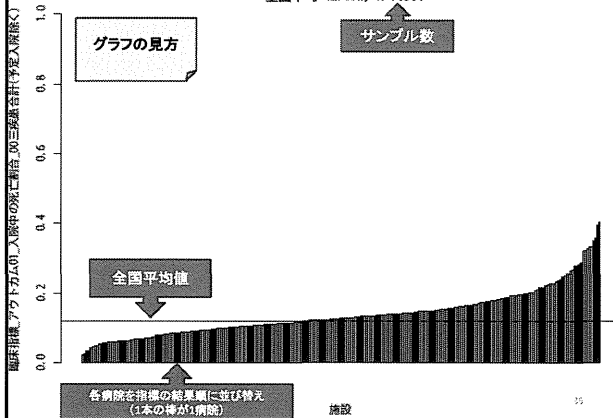
※複数の疾患にまたがる退院患者がいるため、疾患ごとの数字の積み上げは必ずしも「3疾患合計」と等しくならない。

グラフの見方



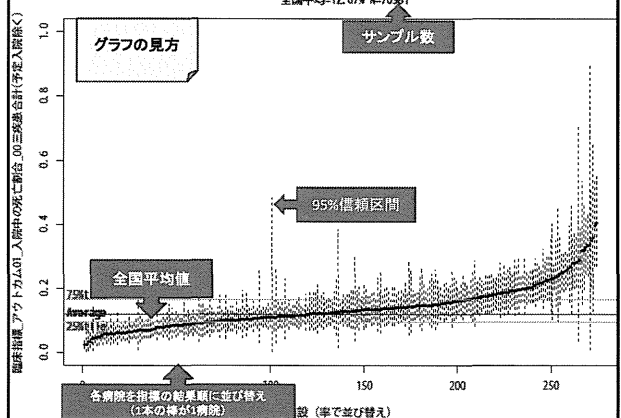
臨床指標_アウトカム01_入院中の死亡割合_00三疾患合計(予定入院除く)

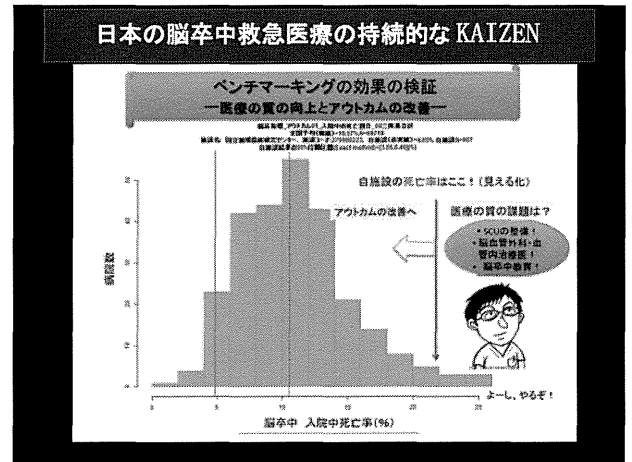
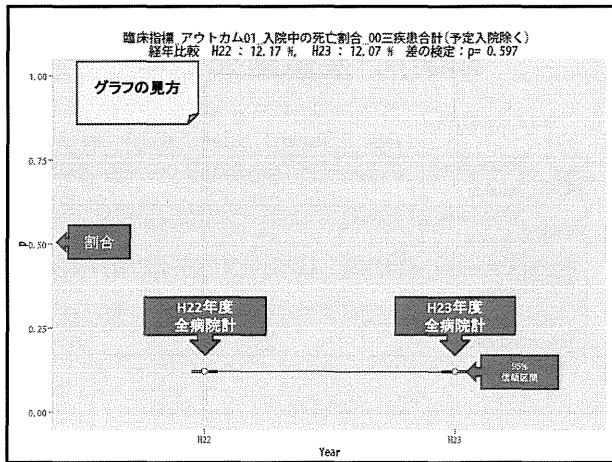
全国平均=12.07%, N=70581



臨床指標_アウトカム01_入院中の死亡割合_00三疾患合計(予定入院除く)

全国平均=12.07%, N=70581





脳卒中救急疫学の確立を目指して
(J-ASPECT Study)

1. 包括的脳卒中センターの要件 (本邦での実態調査)
 - 専門的人員、診断機器、外科・介入治療、インフラ、教育・研究
 - 包括的脳卒中ケア能力の指標の開発 (CSC Scoreの提唱)
 - 研究班ホームページで、研究結果をフィードバック
2. 脳卒中診療医の燃え尽き症候群、立ち去り型退職の実態調査
 - 専門医を対象にした、国内最大規模のBurnoutの横断調査
 - 地方において進行する脳卒中救急医療の崩壊を防ぐための提言
3. DPC情報を活用した大規模包括的脳卒中データベースの構築
 - CSC Scoreとアウトカム(院内死亡率)との関係を検証
 - 過去最大規模 (約270病院、14万件)
4. GIS情報と医療機関情報(DPC)との連結
 - GIS情報(搬送時間)とアウトカム(院内死亡率)との関係を検証
 - アウトカムの改善を目的とした実効医療圏の策定

平成22-24年度 厚生労働科学研究費 (主任研究者 飯原弘二)
「包括的脳卒中センターの整備に向けた脳卒中の救急医療に関する研究」

ご清聴ありがとうございました

Cross-Sectional Survey of Workload and Burnout among Japanese Physicians Working

in Stroke Care:

The J-ASPECT Study

J-ASPECT Study Group

Short title: Nishimura, J-ASPECT Study

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Total word count (including the title page, abstract, text, references, tables and figures legends): 5582 words

Journal Subject Code: [8] Epidemiology

Abstract

Background: Burnout is common among physicians and affects the quality of care. We aimed to determine the prevalence of burnout among Japanese physicians working in stroke care and evaluate personal and professional characteristics associated with burnout.

Methods and Results: A cross-sectional design was used to develop and distribute a survey to 11,211 physicians. Physician burnout was assessed using the Maslach Burnout Inventory General Survey. The predictors of burnout and the relationships among them were identified by multivariate logistic regression analysis. A total of 2,724 (25.3%) physicians returned the surveys. After excluding those who were not working in stroke care or did not complete the survey appropriately, 2,564 surveys were analysed. Analysis of the participants' scores revealed that 41.1% were burned out. Multivariate analysis indicated that number of hours worked per week and after-hours calls per week are positively associated with burnout. Hours slept per night, day offs per week, years of experience as well as income are inversely associated with burnout.

Conclusion: The primary risk factors for burnout are heavy workload, short sleep duration, and relatively little experience. Prospective research is required to confirm these findings and develop programs for preventing burnout.

Key words: burnout, J-ASPECT study, Maslach Burnout Inventory, neurosurgery, stroke,
tissue plasminogen activator

Introduction

Burnout is a syndrome characterized by emotional exhaustion and depersonalization leading to decreased effectiveness at work.¹ In a recent large survey of U.S. physicians, approximately 40% of neurosurgeons were found to have experienced symptoms of burnout.² Another U.S. study found that approximately 40% of surgeons were burned out,³ conditions that are both associated with medical errors.^{4,5} However, limited research has been conducted into the relationship between specific demographic and practice characteristics and burnout among physicians working in stroke care, and no survey research has been conducted among Japanese physicians. Such lack of research is troubling, as stroke is the fourth-leading cause of death in Japan, as well as a leading cause of long-term disability.⁶

The objective of this study was to determine the prevalence of burnout among Japanese neurosurgeons and neurologists working in stroke care and evaluate the personal and professional characteristics associated with burnout among this physician population.

Methods

Study design

In March 2011, a cross-sectional survey was sent to 11,211 physicians, among whom were all board-certified members of the Japanese Neurosurgical Society and the Societas Neurologica Japonica working throughout Japan. The survey was developed by J-ASPECT researchers, based on the previous studies on physician burnout^{3,7,8}. We sent the survey to a

total of 10,791 physicians via postal mail; however, we could not mail the questionnaire to 420 physicians in the 3 Tohoku prefectures that were affected by Great Tohoku Earthquake. The cover letter accompanying the survey informed the physicians that only physicians who are currently working for stroke care are eligible for the survey, that their participation was voluntary, and that their responses would remain anonymous. They were requested to return the completed survey within 8 weeks. The survey contained items that collected data regarding relevant demographic variables and variables related to practice patterns. (Appendix Survey foam) This study was approved by the Institutional Review Board of the National Cerebral and Cardiovascular Center, Japan.

Measurement of burnout, depression, and quality of life

Burnout among physicians was measured using the Japanese version of the Maslach Burnout Inventory-General Survey (MBI-GS), a validated version of the Maslach Burnout Inventory (MBI), which is currently considered the gold standard for measuring burnout.⁹⁻¹¹ This 16-item questionnaire⁷ contains 3 subscales that evaluate what are considered the 3 major domains of burnout: exhaustion, cynicism (depersonalization), and professional efficacy. Based on the results of previous studies using the MBI-GS, which reported that a high score on the emotional exhaustion and/or depersonalization subscale is an indication of physician burnout,^{2, 11-13} and the findings from a survey of Japanese population,¹⁴ an

exhaustion score greater than 4.0 and/or a cynicism (depersonalization) score greater than 2.6 were selected as primary criteria for burnout. The criteria for severe burnout status were an exhaustion score greater than 4.0 and either a cynicism score greater than 2.6 or a professional efficacy score lower than 4.17. The use of at least one additional criterion for severe burnout (i.e. the use of 'exhaustion+1' criteria) was adopted because exhibiting at least one other symptom of burnout besides exhaustion has been reported to be a more appropriate and reliable indicator of severe burnout among the general population¹⁵ compared to the approaches used in former studies of physician burnout.

For comparison of the study population with the general population of Japanese workers, the MBI-GS scores of the participants were compared with the MBI-GS scores of 2,843 Japanese office workers and 751 civil servants that one of our investigators had previously published.¹⁴

Statistical analysis

Standard descriptive summary statistics were used to determine whether the participants had not been burned out, had been burned out, or had been severely burned out at the time of the survey. Continuous variables were analysed using the t-test for independent and paired samples or the Mann-Whitney U test for independent samples and Wilcoxon's rank test for paired samples. The Wilcoxon type test for trend was used to identify any trends in the data¹⁶.

Multivariate logistic regression was used to identify demographic and professional

characteristics associated with burnout. Forward selection using the Akaike information criterion (AIC) was used to select the best predictors. Observations from the missing data in the survey questionnaire were not incorporated in this study. The interaction (effect modification) between predictors was determined by evaluating whether the interaction terms were significant. All statistical analyses were conducted using SAS version 9.3 (SAS Institute Inc., Cary, NC, USA) and STATA 11 (STATA Corp., College Station, TX, USA) software, all tests were 2-sided, and all values that had a p-value less than 0.05 were considered significant.

Results

Burnout among Japanese physicians working in stroke care

Figure 1 shows the process used to select the study participants. Of a total of 11,211 board-certified neurosurgeons and neurologists practicing in any prefecture excluding the three prefectures affected by the Tohoku earthquake ($n = 469$), 2,724 (25.3%) returned the survey. Among these, 2,635 (97.0%) completed the questionnaire appropriately for analysis of their responses. After excluding 71 (2.7%) physicians who reported that they were not working actively in the field of stroke care, a total of 2,564 physicians remained for analysis. At the time that they completed this survey, the study population had been in practice for a mean of 21.7 years, worked a mean of 66.3 hours per week, were on duty a mean of 2.91

nights per month, and received a mean of 2.00 after-hours calls per week. Among these 2,564 physicians 1,525 (59.4%) were employed at 578 teaching hospitals or comprehensive stroke centers (CSC) that were participating in a survey of CSC as part of the J-ASPECT study group. As 3,757 physicians were working at institutes participating in the J-ASPECT study in March 2011, the average response rate among active stroke-care centre physicians was estimated at 40.6%. Other relevant personal characteristics regarding the study population are summarized in Table 1.

To investigate the possibility of selection bias, we checked the address of responders and non-responders. The response rate was not statistically different in all 44 prefectures in this analysis (P=0.683). We also found no statistically significant differences for age, sex, and specialty (neurologist vs neurosurgeon) among early responders compared with late responders.

Review of the participants' MBI-GI scores indicates that 41.1% (N = 1,055) of the study population was burned out and 21.8% (N = 560) was severely burned out at the time of the survey (Figure 2). Consideration of the scores of the study population as representative of the population of Japanese physicians working in stroke care and comparison of their scores with the MBI-GS scores of 2,843 office workers and 751 civil servants indicates that the prevalence of burnout and severe burnout among stroke care physicians (41.1% and 21.8%, respectively) is significantly higher than that among civil servants (28.8%, $p < 0.001$ and