図1. 3群のCBS観察得点：観察得点・自己評価得点・Anosgnosia得点
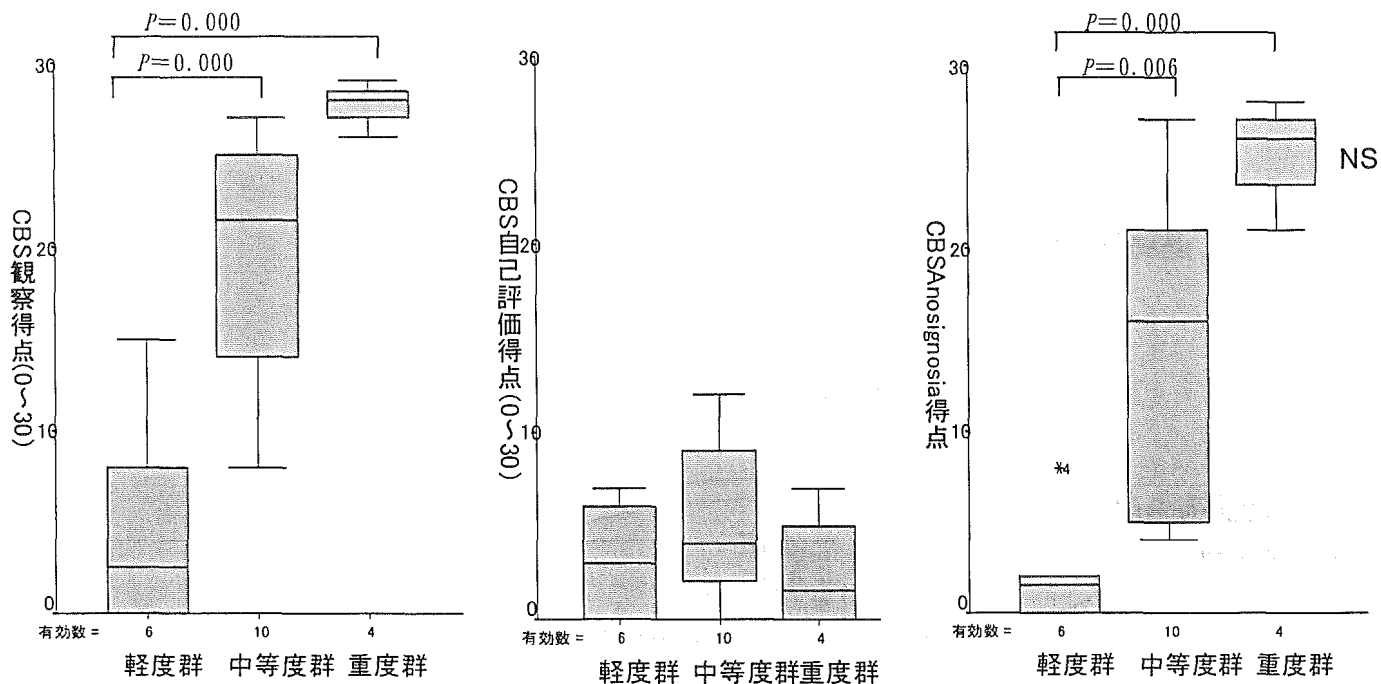
図2. 意識の階層モデル（苧坂直行、2000）

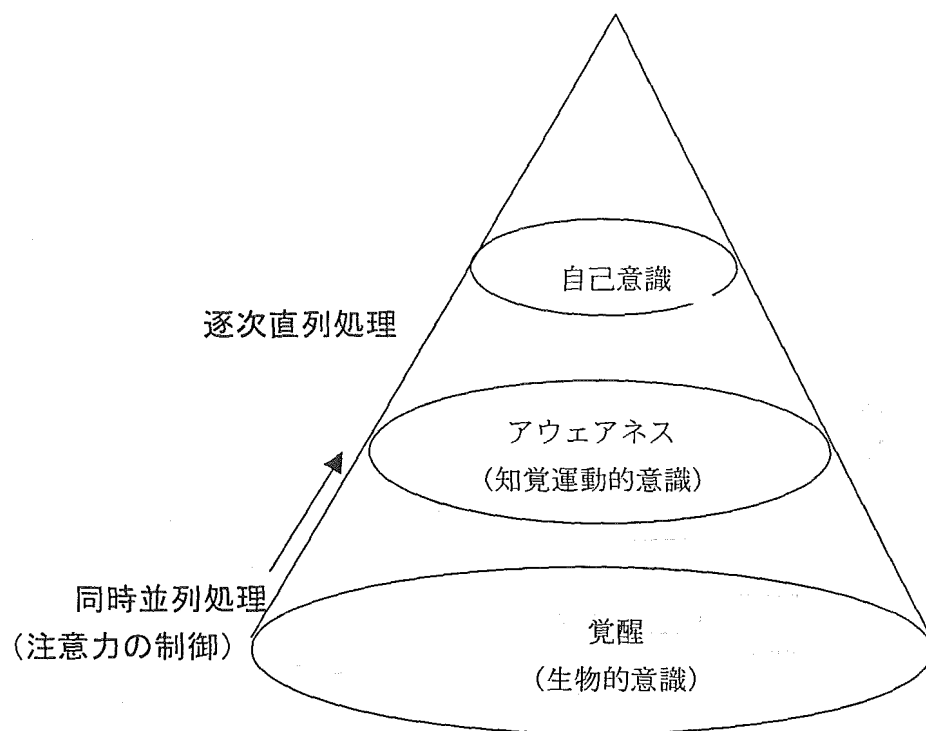自己意識

逐次直列処理

アウェアネス
（知覚運動的意識）

同時並列処理
（注意力の制御）

覚醒
（生物的意識）

表 1. 右大脳半球損傷例のインタビューから得られた特徴的テーマとそこに含まれるトピック

[テーマ]Trying to adjust to the present health circumstances（現在の健康状態に合わせようとする）

[トピック] 右大脳半球損傷例から得られたもの
- Being able to do things in the way he wants（何事もやりたいようにできる）
- Trying to get back to a normal life, dealing with his bad left hand while emphasizing readiness to hustle（自分を元気付けながら動かない左手を操って元の生活に戻ろうとする）
- Balance in walking, eating and daily living itself（運動や食事、生活のバランスをとる）
- Being able to accomplish everyday things like working so his body doesn't become lazy（仕事など毎日の用を済ませることができれば体は鈍らない）
- Never having a major illness until 85 years old（85歳になるまで大病をしたことがない）
- Persuading himself that he shouldn't be angry（怒ったりしないよう自分に言い聞かせる）
- Her husband becoming sick because of her sickness and being taken care of by her sons instead of her taking care of them（自分の病気のため夫が体調を崩し、息子たちの面倒をみるのではなく面倒をみてもらう）
- Having no choice but to quit smoking and reduce salt as a matter of survival（長生きするためにはタバコをやめ塩の摂取を減らす以外にない）
- Living with his wife who has aphasia by stroke（脳卒中のため失語症になった妻と生きていく）
- To do laundry and cook like other people（炊事洗濯を他の人と同じようにやる）

次のもののみは左大脳半球損傷例から得られたものである
- Paying attention to what she eats（食べ物に気をつける）

脳卒中患者の失認・失行と
生活障害に関する研究
ワークショップ
2004.9.25

抄録

脳卒中患者の失認・失行と生活障害に関する研究：ワークショップ

● テーマ ： 失認・失行のリハビリテーション・看護・ケア ～ 脳卒中患者を中心に ～
● 内容 ： 脳卒中患者の約3割に合併する失認・失行について、
　　　　　医学、心理学、看護学などの立場から、ケア・研究の方向性を検討する
● 日時 ： 2004年 9月 25日（土） 14：00～17：00 （13：30開場）
● 場所 ： 東京大学山上会館 小会議室（201）
● 参加費 ： 無料
● 司会 ： 江藤 文夫 （東京大学大学院医学系研究科 リハビリテーション部 教授）
● プログラム

時刻	内容	発表者	所属
13：30	開場 / 受付		
14：00	開会挨拶	村嶋 幸代	東京大学大学院医学系研究科 地域看護学分野 教授
14：10	失認・失行の頻度および生活障害との関連	高橋 龍太郎	東京都老人総合研究所 参事研究員
14：20	半側空間無視を中心に	石合 純夫	東京都神経科学総合研究所 リハビリテーション研究部門長
14：40	心理の臨床から	尾関 誠	特定医療法人慈泉会 相澤病院 総合リハビリテーションセンター
15：00	高次神経障害と作業療法	鈴木 孝治	茨城県立医療大学 保健医療学部作業療法学科 助教授
15：20	失認・失行と看護ケア	大島 浩子	東京大学大学院医学系研究科 地域看護学分野 博士課程
15：40	討議		
	指定発言	今福 一郎	横浜労災病院 神経内科部長
		金丸 和冨	東京都老人医療センター 神経内科医長
		小林 明美	七沢リハビリテーション病院 看護師長
16：20	まとめ	江藤 文夫	東京大学大学院医学系研究科 リハビリテーション部 教授
16：30	閉会		
17：00	閉場		
17：30	懇親会		

問い合わせ先 ： 東京大学大学院医学系研究科 健康科学・看護学専攻 地域看護学分野
大島 浩子（oosima-tky@umin.ac.jp）, 村嶋 幸代, 長弘 佳恵.
〒113-0033 文京区本郷 7-3-1 医学部 5 号館1階 Tel & Fax: 03-5841-3597

失認・失行の頻度および生活障害との関連

東京都老人総合研究所　　　　高橋龍太郎

[目的]

　脳血管障害初発症例を対象に、失認・失行の頻度を求めると共に生活機能との関連を明らかにする。

[対象と方法]

　対象は、1997年6月から5年間にTセンターリハビリテーション科に入院した脳血管障害連続587例のうち、再発17例、麻痺なし・両側麻痺47例、小脳・脳幹病変13例、左利き1例計78例を除く509例で、失認・失行・失語の判定は、医師と理学・作業療法士・言語聴覚士・臨床心理士が入院3週間後までに評価と観察によって判定した。また、認知機能評価はMMSE、基本的ADL評価はBarthel20点法、手段的ADL評価はLawton8点法を用いた。統計学的分析は、χ²検定、t-検定、および分散分析（一般線型モデルGLM）によって行った。

[結果]

　対象者の平均年齢は73.8歳（50-93）、男性と女性はそれぞれ283例、226例(55.6％vs. 44.4％)だった。脳血管障害の内訳は、脳梗塞351例(69％)、脳内出血134例(26％)、クモ膜下出血24例(5％)だった。全症例についての失認・失行の頻度は、失認のみ108例(21％)、失行のみ48例(9％)、失認と失行両者の合併33例(6％)、いずれもなし320例(64％)で脳血管障害初発症例の36％に失認・失行いずれかの合併がみられた。失認・失行は麻痺側と関連することが知られているので、この点を分析してみると、右片麻痺279例では13.7％に失認を18.0％に失行を合併し、左片麻痺230例では44.8％に失認を13.4％に失行を合併していた。

　さて、失認・失行の合併が退院時ADLに与える影響を調べるため、麻痺の重症度を共変量とし、麻痺側を独立変数とする分散分析を行ったところ、失認を伴うとリハビリテーション後のADLは低レベルにとどまることが示された。（下図）
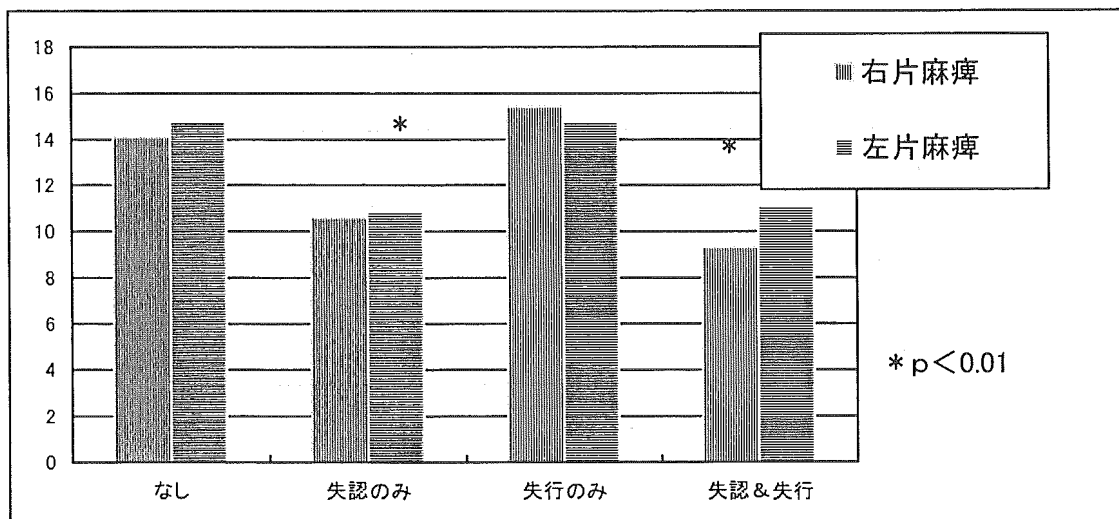
　また、リハビリテーションによるADL改善度と失認・失行の関連を、同様に麻痺の重症度と麻痺側を調整して分析したところ、ADLの改善度は、利き手である右上肢が麻痺しているにも関わらず右片麻痺群のほうが勝っていた。これらの結果は、失語83例を除いた分析でも同様であった。

半側空間無視

東京都神経科学総合研究所リハビリテーション研究部門
石合　純夫

定義：大脳半球病巣と対側の刺激を発見して反応したり，その方向を向くことの障害(Heilman et al, 1985)
脳血管障害によりリハ入院を要する患者：右半球損傷:3～4割／左半球損傷：まれ
基本的に頭部や視線の動きを自由にした状況で生じる症状である．

病巣：右半球の多彩な部位の損傷で起こりうる．
　　右側頭－頭頂葉（下頭頂小葉）を含む大病巣に多い：中大脳動脈領域梗塞が代表
　　その他，前頭葉梗塞，後大脳動脈領域梗塞（側頭葉内側部に梗塞が及ぶ場合，視床穿通枝梗塞を
　　伴う場合），前脈絡動脈領域梗塞
　　大きな被殻出血，視床出血

本人は問題点を認識できない！
- 　「食事やリハビリテーションで左側の物を見落とすことがありますか？」と問うと，「左側に不注意なので注意するようにしています」と言う．
- 　しかし，「自分で左側に不注意と思いますか？」と問うと，「自分ではしっかりと見ているつもりだが，先生に注意される」という態度である．

幅広い日常生活に問題と危険が！
- 　食事で左側の品物を見落す
- 　車いすとベッドとの移乗で転倒
- 　ものや人にぶつかる
- 　道に迷う
- 　服をうまく着られない

検査：BIT行動性無視検査日本版

BIT通常検査：最高点とカットオフ点

通常検査	最高点	カットオフ点*
線分抹消試験	36	34
文字抹消試験	40	34
星印抹消試験	54	51
模写試験	4	3
線分二等分試験**	9	7
描画試験	3	2
合　計	146	131

*カットオフ点以下を異常とする．

心理の臨床から

高次脳機能障害への心理士の対応

特定医療法人慈泉会　相澤病院総合リハビリテーションセンター　臨床神経心理士　尾関　誠

はじめに

　神経心理学的リハビリテーションを進める上でまず大切なことは、患者が感じる挫折感、困惑、不安などに対して援助することである。高次脳機能障害は身体の障害と比較した場合、目に見えない障害であり、理解が困難なものである。その上、失行失認は記憶障害や注意障害にくらべ直感的に理解が難しいため、この傾向が一層強いといえる。脳損傷を負った患者はもちろん家族にとっても理解が難しいために、不安をはじめとする心理面へのケアや家族の患者への対応方法の指導も重要と思われる。このような観点から今回、患者および家族の心理面と家族指導に焦点を当て、2つの症例を提示し、検討していく。

一症例1－M.S. 60歳 男性

診断名：くも膜下出血術後後遺症　5/24 高次脳機能障害診断　**現病歴**：H15.12.7 くも膜下出血（脳底動脈瘤破裂）発症し、T病院に入院。H16. 5.26 リハビリ目的にて当院へ転院。**入院時所見**：前医からの情報によれば、作話にもとづき離棟・離院を何度も繰り返すなどの問題行動があり日中一人になる自宅へは帰せない状態。実際転院初日より離棟の言動を繰り返していた。またRBMT SPS 7/24 をはじめとする神経心理学的評価は重度であった。その一方で現実的な対応がとれることがある、一部の見当識の入力は比較的早期に可能であるなど、評価点ほどの低下ではないと思われた。**問題点**：記憶障害を中心とする認知障害と作話にもとづく離棟・離院などの問題行動。

対応：認知障害に対して認知リハビリテーションを実施（環境調整、RO訓練、スケジュール設定、メモリーノート訓練、注意訓練など）。脱抑制的な言動に対してはタイムアウト法。作話に基づく離棟言動に対して緊急時連絡カードの装着と病棟及びリハスタッフによる統一対応（①現実見当識入力、②訴えを傾聴しつつ話題を逸らす対応）。**結果**：作話は残存したものの転院後2週間で離棟・離院言動は消失した。そのため落ち着いた病棟生活を送り、訓練を実施できるようになり、自宅でも日中1人で過ごすことができるようになった。また神経心理学的評価の上では、退院時のRBMT SPS 14/24 と大幅な改善が認められた。**考察**：問題行動であっても患者の訴えに傾聴すること、そして認知障害や認知機能を考慮した心理的対応が効を奏し、落ち着いた生活を送れるようになった。

一症例2－M.M. 33歳 女性 一児の母

診断名：ウェルニッケ脳症　**現病歴**：H14.1.22 妊娠悪阻により近医に入院。同 2.17 意識障害が発現。救急病院に転院し、ビタミンB1投与後に意識改善したが、失調症、記憶障害など残存。同 4.1 にリハ目的にて当院へ転院。**画像所見**：MRIでは入院時に左側扁桃体に高信号域が、発症から1年後には年齢に相当しないび漫性の脳萎縮が認められた。**主訴**：発動性の低下、重度の記憶障害を中心とする認知障害、体幹失調症　四肢のしびれ。**経過**：これまで合計4回の入院と外来対応が行われた。設定したスケジュールであっても、病棟生活ではスケジュールの参照を含めてほぼ全ての行動に促しが必要な状態だった。しかし徐々に自立行動が増えた段階で自宅（義父母宅）退院をし、自宅では介護しきれない状態まで悪化すると再び入院をしていた。**問題点**：重度の記憶障害と発動性の低下により自ら行動することはほとんどなく、自宅ではほぼ全ての行動に促しが必要であった。また家族の障害理解が不十分であり、適切な対応がとれなかった。

対応：本人への認知リハビリテーション（特にスケジュールを参照しそれに沿った行動）の継続を義父母、特にキーパーソンである義母に依頼した。このとき介護による悩みを傾聴し、困難さを汲み取り、相談の上で可能と思われる具体的な目標を設定し、対応方法を指導した。**結果**：発症から2年半経過した段階で、予め設定されたスケジュール内容を何も見ずに実施し、空き時間には自ら手芸を行うなどの積極性も出てきた。**考察**：て外来時においては、家族がセラピストとしての役割を担う。この家族の苦労、不安を汲み取るなどの心理的対応をすることが、当事者・家族の不安や苦痛を低減させ、また最終的には患者の回復に大きく影響することになる。

結論

　上記2例を通して、高次脳機能障害のリハビリテーションにおいて、患者のみならず家族の心理的なケアを考慮した対応が重要であると思われる。

高次神経障害と作業療法
振動覚刺激による移乗動作時の確認行為の変化

茨城県立医療大学保健医療学部　　　　作業療法学科　　　　　鈴木孝治

【目的】　どの方向からの振動覚刺激が移乗動作時の視覚的な安全確認に効果を及ぼしているかを検討する。

【対象】　76歳、男性。脳梗塞、左片麻痺、左半側無視。発症後1年半経過した時点から実験開始。

【方法】　単一事例研究法。独立変数を4種の振動覚刺激（右・左・両側・無）とし、従属変数に移乗動作時の確認行為16項目の得点をあてた。

【手続】　4種の振動覚刺激は各5セッションづつとし、計20セッションとしたが、その順序はランダムに配列させた。各セッションのプログラムは、

　　(1)cancellation test による半側無視、聴覚刺激による汎性注意、車椅子と椅子との間の移乗動作時での確認行為のチェック

　　(2)サンディング・ペグ移動訓練・関節可動域訓練

　　(3)バイブレーターでの振動覚刺激

　　(4)即時効果の検討・・・(1)のチェックを再度施行

【結果】

①刺激の入力側による比較では、刺激入力後での4種の刺激間で検討すると、左刺激が効果大であった(図1)。

②刺激入力の前後の比較では、左刺激は刺激前後で明らかに変化が認められた(図2)。

③各刺激が確認行為に及ぼす方向的な影響では、左刺激は左空間に対して視覚的な確認行為を促通するというよりも、右空間および①で示したように、全方向に対して確認行為を促通した。

④刺激の入力側と半側無視との関係では、左刺激でも cancellation score にはあまり影響を与えなかった。
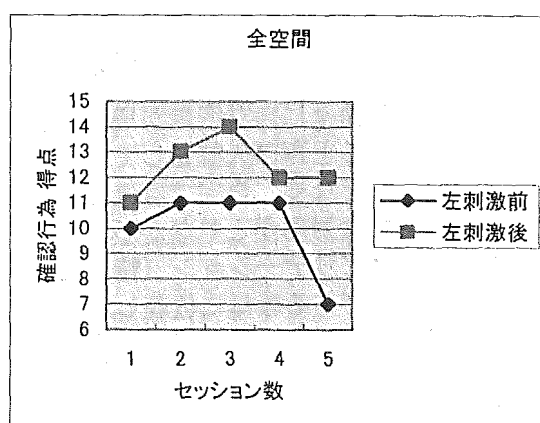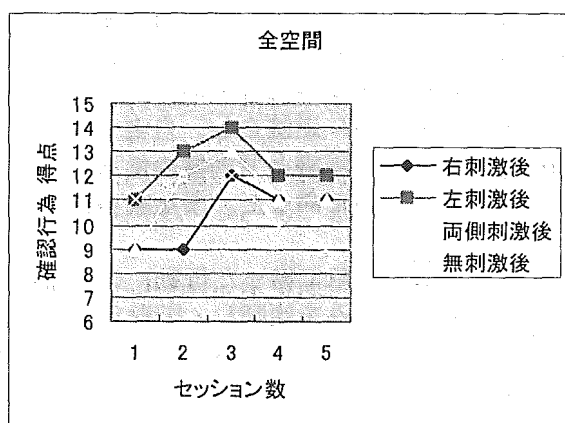
【結論】　左尺骨頚状突起に与えた振動覚刺激は、骨伝導により右体性感覚野に入力され、右頭頂連合野を活性化させ、視覚的な確認行為に変化を与えたと考える。このため、左一側性の方向性注意を向上させるというより、汎性注意を向上させたと推察される。

失認・失行と看護ケア

半側空間無視（Neglect）を有する患者の生活障害
- the Catherine Bergego Scale(CBS)による評価の試み -

東京大学大学院　医学系研究科　地域看護学分野

大島　浩子

【はじめに】半側空間無視（以下，Neglect）を有する脳卒中患者の生活障害評価尺度は見当らない。
看護師がケアを提供するうえで、患者の生活障害の特徴を評価する尺度が必要である。
the Catherine Bergego Scale (以下，CBS)が開発された　→　Neglectを有する脳卒中患者
のリハビリテーション期の日常生活における10項目のNeglect行動評価尺度
評価者の観察を観察得点, 患者の自身の評価を自己評価得点、両得点の差をAnosgnosia得点とし評価

【目的】CBS を用いて患者の Neglect 行動の評価と重症度による CBS 各得点の関連を検討する。

【対象】CBS の作者から CBS 日本語版（以下，CBS-J）の作成と使用、発表の許可を得て翻訳を実施。
地域中核病院に入院した全脳卒中患者のうち、①初発、②右大脳半球損傷、③失認・失行有り、の
3 基準を満たし、同意が得られた 20 名(平均年齢 70.4 歳,男性 16 名,女性 4 名;梗塞 16 名,出血 4
名,発症後週数 10.7±6.3 週,12 名:Neglect のみ、4 名:Neglect と病態失認, 2 名:Neglect・病態失
認・左右失認・身体失認,1 名:Neglect・病態失認・身体失認、1 名:着衣失行を有していた)。

【方法】ADL に Barthel Index (以下，BI)、認知能力に Mini-Mental State Examination(以下，
MMSE)を用いた機能評価、および CBS-J を用いた Neglect 行動観察と面接調査を実施した。分
析は The National Institutes of Health Stroke Scale (以下，NIHSS)を用いた脳卒中重症度に
より 3 群，即ち，軽度，中等度、重度に分類し、群間における患者の特性と CBS の関連を検討し
た。

【結果】脳卒中重症度が高いと CBS-J-観察得点 CBS-J-Anosgnosia 得点が高く、BI，MMSE は低か
った。一方、CBS-J-自己評価得点には重症度との関連がみられなかった（図 1）。

【考察】3 群間の属性に差はなかった。重症度に応じて CBS-観察得点、CBS-Anosgnosia 得点が高い
ことは、Neglect 行動、病態失認が共に高いことを示し、CBS-自己評価得点と重症度に関連がない
ことは、患者が日常生活の Neglect 行動を認識できないことを示していると考える。

【結論】CBS は、脳卒中患者の日常生活における Neglect 行動を充分観察・評価し、患者の認識の差に
注目して評価することができる有用な尺度である。
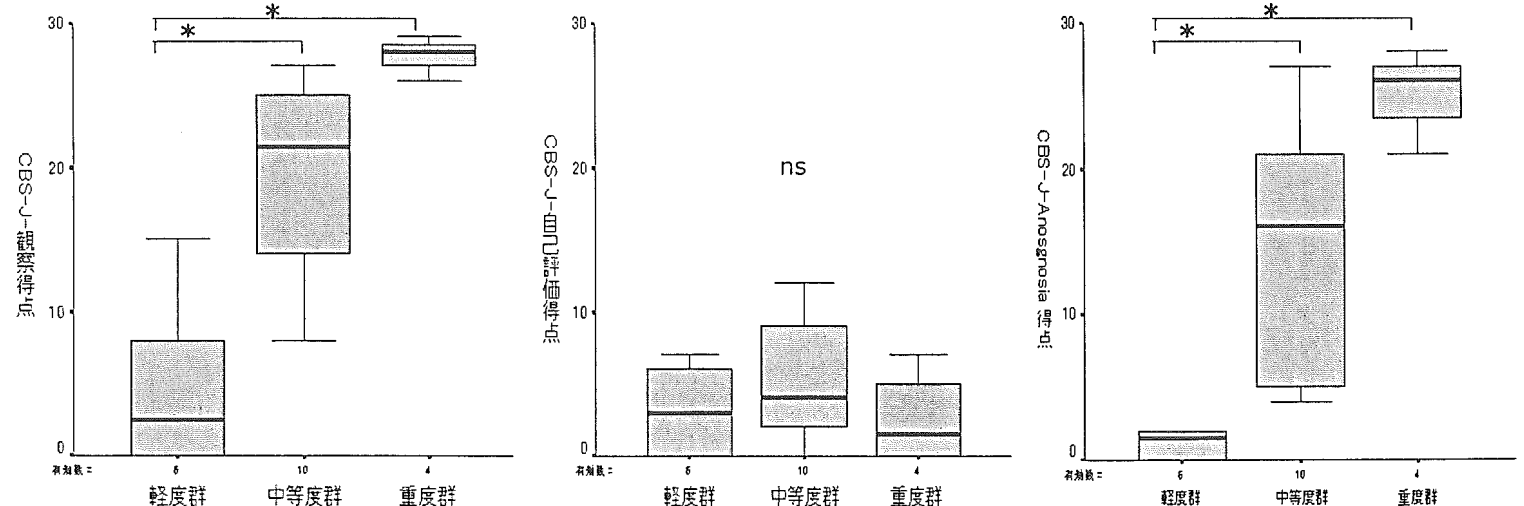CBS-Jの活用は、Neglectを有する脳卒中患者の生活評価と看護ケアを検討する一助となる。

図1. 3群のCBS各得点の比較

II. 研究成果の刊行に関する一覧表

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III. 研究成果の刊行物・別冊

Characteristics of Patients with Higher Cerebral Dysfunction and Approaches of Nursing Care : Focusing on Agnosia and Apraxia

Hiroko Ohshima[1]   Sachiyo Murashima[1]   Ryutaro Takahashi[2]

Abstract

Purpose : This study aimed to identify the behavioral characteristics of agnosia and apraxia in patients with higher cerebral dysfunction following cerebrovascular diseases, and to examine the approaches of nursing care.

Methods : We studied 12 patients admitted to the rehabilitation ward who satisfied the following criteria : (1) initial cerebrovascular event, (2) less than 1 year after onset, (3) with a clinical diagnosis of agnosia or apraxia. Study items included patient attributes, primary disease, types and degree of higher cerebral dysfunction, activities of daily living (Barthel index : BI), cognitive ability (mini-mental state examination : MMSE) , interviews with patients and families, and behavioral observation under daily life setting. From all the information collected, common items related to higher cerebral dysfunction were extracted, and grouping was attempted by positioning them in the four quadrants of MMSE-BI plots.

Results : Four groups were classified. The characteristics and implications for nursing care for each group were analyzed. Group 1 (first quadrant : MMSE score ≥24, BI score >60) preserved high physical and cognitive abilities. Patients were aware of left spatial neglect (neglect) . Although behaviors were successfully adjusted, nursing care should consider the potential attention disorder. Group 2 (second quadrant : MMSE score ≥24, BI score ≤60) preserved high cognitive ability although physical capability was low. When being called while engaging in continuous activity, these subjects often became confused and discontinued on-going activity, and they showed displeasure over such situation. Nursing care should consider the way and timing of calling their attention. Groups 3 and 4 (third quadrant : MMSE score <24, BI score ≤60) were low in both physical and cognitive abilities. Group 3 was almost incapable of directing attention to the left. Nursing care should observe the division of attention and design methods of stimulation. Group 4 was severely disabled physically and cognitively so that agnosic and apraxic behaviors are difficult to observe. Observations and evaluations considering these aspects are essential and form the basis of care.

Conclusion : Groups 1 and 2 of behavioral classification correspond to the first and second quadrants, respectively, of the BI/MMSE classification. However, both groups 3 and 4 fell within the third quadrant, suggesting the need for new classification tools other than BI and MMSE.

Key words : Higher cerebral dysfunction, neglect, attention disorder, Barthel index, Mini-mental state examination

Introduction

Cerebrovascular diseases are often followed by various sequelae. After the acute phase, almost half of the patients develop higher cerebral dysfunction[1].

Higher cerebral dysfunction id defined as injury of the cerebral cortex leading to language, behavior, cognition, memory and attention disorders[3]. This dysfunction possesses two facets ; functional localization of the brain and also the neuropsychological

aspect, and is difficult to study because of the diversity of symptoms manifested. Among these symptoms, the pathological states of agnosia and apraxia are diverse and changeable, and evaluation and management are considered to be difficult[3]. To our knowledge, there is no previous study in nursing on higher cerebral dysfunction, especially focusing on agnosia and apraxia. However, conventional nursing practice often attempts to improve spatial neglect in these patients by arousing the patient's attention to the left side[4-6]. In the fields of rehabilitation and neurology, spatial neglect is frequently observed in patients with right brain damage due to cerebrovascular diseases, and is known to be a prognostic factor[7-9]. Although rehabilitation for spatial neglect has been attempted, research of its efficacy still contains many problems. Furthermore, since higher cerebral dysfunction has a neuro-psychological element, patient care should consider not only the symptom but also the neuropsychological aspect. However, nursing methods that respond to patient's attribute has not been developed. Development of nursing management related to the patient's daily living is urgently required.

In the present study, we studied patients with cerebrovascular diseases and manifested higher cerebral dysfunction of agnosia and apraxia. We attempted to elucidate the following : (1) what symptoms and behaviors do these patients have, (2) how can agnosia and apraxia be recognized, and what psychological states are involved, and (3) how does the dysfunction disable daily living. From the findings, we also examined the approaches of nursing care for these patients.

Methods

1. Subjects

Among patients admitted to the rehabilitation wards of the Tokyo Metropolitan Geriatric Hospital, twelve patients who satisfied the following criteria were included in the study : (1) the current admission was the first cerebrovascular event, (2) less than 1 year after onset, (3) agnosia or apraxia was diagnosed by medical doctor, occupational therapist and clinical psychologist.

2. Study methods

1) Information collection from clinical records : From the clinical records of doctors, nurses, occupational therapists and clinical psychologists, the following patient information was collected and copied.

(1) Patient attributes, disease and condition : Age, gender, name and site of disease, date of onset, status of complications, current symptoms

(2) Functional evaluations : Type and severity of higher cerebral dysfunction, degree of paralysis (Bunnstrom stage[10]), activities of daily living (Barthel index[11] : BI), cognitive ability (mini-mental state examination[12] : MMSE)

2) Information collection other than clinical records : Information not recorded, such as the patient's daily living and relationship with the family, were collected from the attending doctors and attending nurses.

3) Interview : Semi-structured interviews of the patients and their families were conducted. The patients were asked about the behaviors, emotional aspect and difficulties concerning agnosia or apraxia. The families were asked the same questions about the patients from the viewpoint of the families. The interviews were recorded and then transcribed. Prior to an interview, the attending doctor or ward nurse introduced the researcher, and explained the objective and method of the study. After obtaining consent to participate in the study, the researcher again explained to the patient and the family of the principle, objective and method of the study and their rights of refusal, and then requested the interview and recording. Interviews were conducted in the ward or dining room and maximum efforts were made to protect privacy.

4) Behavioral observation : The behaviors of the patients under daily life setting (in bed, moving around, eating, during rehabilitation, etc.) were observed. The following information was collected : (1) characteristics of the patient's behaviors, (2) characteristics of the patient's cognition, (3) problems resulted, and (4) the nursing care provided. To ensure validity of the findings, the contents of observations were confirmed by the ward nurse, patient, family and doctor.

3. Methods of analysis

1) Classification by scattergram : Scattergrams of the subjects with respect to MMSE and BI scores were

Table 1　Summary of subjects　　　　(n = 12)

Age (yr)		72.0 ± 7.0 (64 to 84)
Sex	Male/female	9/3
Diagnosis	Infarction	9
Paralysis : Brunnstrom stage (left)	I to III	8
	VI, V	4
Duration from onset (months)		2.8 ± 2.0 (1 to 8)
Type of higher cerebral dysfunction	Left spatial neglect	11
	Attention disorder	9
	Anosognosia	7
	Left asomatognosia	1
Cognitive ability (MMSE score)		22.7 ± 6.6 (12 to 29)
Physical ability (BI score)		46.7 ± 20.0 (15 to 90)

Figures are number of subjects or mean ± SD (range)

plotted. For the MMSE, the cutoff score was set at 24 points, which indicate a normal cognitive state[13-16]. For BI, the cutoff score was 60 points, which indicate independence of self-care and independence of in-door living[17-22]. Classification of the subjects was attempted using these criteria.

2) Classification by common extracted items : From all the information collected from each subject, those items that were considered to be related to higher cerebral dysfunction were classified into (1) subjective data based on the contents of conversation, and (2) objective data based on observed behaviors. Next, the problems or items for each subject were extracted, and checked for commonality with problems identified in other subjects. Then subjects showing high commonality in problems were grouped.

3) Grouping of subjects and identifying characteristics : The results of classification by the above two methods were compared and the subjects were divided into groups. The characteristics of each group and the implications on nursing care were examined.

Results

1. Summary of subject attributes

The subject background is summarized in Table 1. The subjects consisted of 9 males and 3 females with mean age of 72.0 ± 7.0 years (mean ± SD range : 64 to 84 years). The diagnoses were cerebral infarction in 9 subjects and cerebral hemorrhage in 3. All subjects were right-handed. The lesions of all subjects were located in the right cerebral hemisphere with left

paralysis, and Brunnstrom stage for upper and lower extremities was I to III (severe) in 8 subjects and VI to V (moderate) in 4. The mean interval after onset was 2.8 ± 2.0 months. The higher cerebral dysfunction manifested mainly as unilateral spatial neglect (neglect) , attention disorder, and anosognosia. The mean MMSE score was 22.7 ± 6.6 points and the mean BI score was 46.7 ± 20.0 points.

2. Grouping of subjects

1) Classification using scattergram

When the MMSE and BI scores were used to construct a scattergram and then classified using the respective cutoff values, the following four groups were obtained (Fig. 1). Three subjects with MMSE score≥24 and BI score>60 had relatively high physical and cognitive abilities (first quadrant : group 1) . Four subjects with MMSE score≥24 and BI score≤60 had high cognitive ability although physical function is low (second quadrant : group 2) . Five patients with MMSE score<24 and BI score≤60 were low both in cognitive and physical abilities (third quadrant) . When common items were extracted from characteristics of behaviors and cognition, problems, and nursing care provided, the 5 subjects were further divided into two groups (group 3 and group 4).

2) Characteristics of each group

The characteristics of each group of subjects are shown in Table 2. Group 1 was characterized by preserved cognitive ability ; mild to moderate paralysis with high physical ability ; and manifestation of neglect, attention disorder and anosognosia. Group 2 was
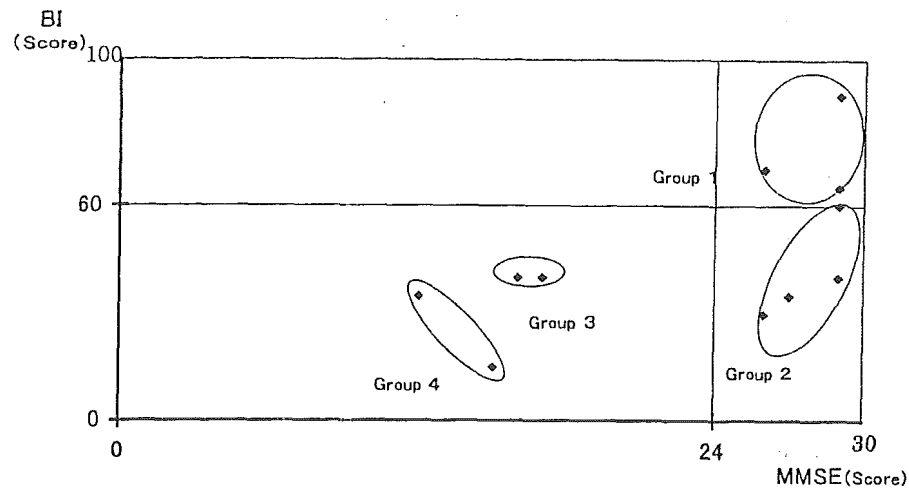
Fig. 1 Classification based on MMSE score, BI score, behavioral characteristics, communication, cognition and affection

Table 2 Summary of subjects classified in groups

	MMSE	BI	Sex	Age	Diagnosis	Time after onset (m)	Paralysis Brunnstrom Stage	Neglect	Attention disorder	Anoso-gnosia	Left-right agnosia	Left asomato-gnosia	Memory disorder
Group 1	29	90	M	70	infarct	1	IV-II-IV	−	+	−	−	−	−
	29	65	M	73	hemo	1	IV-IV-IV	+	−	+	−	−	−
	26	70	M	78	infarct	2	IV-IV-IV	+	+	−	−	−	−
Group 2	29	60	M	64	hemo	1	V-V-IV	+	−	+	+	−	−
	29	40	M	67	infarct	3	III-III-III	+	−	−	−	−	−
	27	35	M	65	infarct	8	I-I-I	+	+	−	−	−	−
	26	30	M	67	infarct	2	I-I-III	+	+	+	−	+	−
Group 3	17	40	M	72	infarct	4	I-I-II	+	+	−	−	−	−
	17	40	M	66	hemo	1	I-I-III	+	+	−	−	−	+
	16	40	F	84	infarct	3	I-I-II	+	+	+	−	+	+
Group 4	15	15	F	83	infarct	4	II-II-II	+	+	+	−	+	+
	12	35	F	78	infarct	3	I-I-I	+	+	+	−	+	+

Paralysis was all left-sided ; hemo : hemorrhage

characterized by preserved cognitive ability ; severe paralysis with low physical ability ; and symptoms of neglect, attention disorder, anosognosia, left-right agnosia, and asomatognosia. Group 3 was characterized by low cognitive ability ; severe paralysis and low physical ability ; and symptoms of neglect, attention disorder, anosognosia, asomatognosia, and memory disorder. Group 4 was characterized by low cognitive ability ; severe palsy and low physical ability ; and symptoms of neglect, attention disorder, anosognosia, asomatognosia, and memory disorder.

3) Characteristics of behavior or cognition, problems, nursing care provided in each group

a) Group 1

The subjects had left spatial neglect, and bumping on the left side sometimes occurred. When bumping on the left side occurred, the subjects were aware and capable of behavioral adjustment such as changing direction of the wheelchair. Although conversation was smooth, the patients might abruptly become vague in the middle of conversation, or bustle around showing restlessness, or act on some hasty judgement. Sometimes, irrelevant

behaviors could be seen. The subjects accepted the calls "to arouse attention to the left side" and assistance from nurses and families, and did not feel stressful toward their care.

In these subjects, assistance for paralysis and assistance to gain independence of mobility were provided. In response to the care of arousing attention, the subjects managed to direct attention toward the left side. However, they occasionally exhibited irrelevant behaviors, probably out of their own interpretation.

b) Group 2

This group made many mistakes in handling the wheelchair, and could not master the manipulation. Each action was markedly clumsy. When moving, the body faltered toward the left side, resulting in loss of balance and bumping toward the left side. Even when bumping on the left occurred, they were unaware of it and could not manage behavioral adjustment. When these subjects were engaged in continuous activities, if they were called by somebody else, they became confused and showed a perplex expression of "not knowing what to do", brooded over the situation, and stopped what they were doing. The more they were told what to do, the more confused they got, and finally discontinued their activities and had difficulties restarting again. The subjects showed strong displeasure over being cared and called. They did not pay enough attention to their spatial neglect, and bumped into barriers. They thought that all the problems would be solved only if they could walk.

In these patients, assistance to gain dependence of mobility and guidance to improve spatial neglect (rousing attention) were provided. However, the subjects were strongly displeased with this care, and care providers were not able to achieve the guidance role. For these patients, the way of calling out to them and the timing need to be considered. Observations regarding the subjects' recognition of their own disability and the way they respond were considered necessary.

c) Group 3

In this group, actions were crude and marked inattention was obvious. The balance of sitting posture was poor. The body tilted toward the left, tumbled down, and remained fallen. They paid almost no attention to the paralyzed side. Even when the paralyzed side was pinned under the trunk, the patients were totally unaware. "Younger brother's hand is heavy", or "The paralysis is only slight, there is no problem at all", they said, denying their own paralysis and disability. Furthermore, they spoke in a loud voice regardless of the situation, and engaged in one-way talk about the same subject. The subjects had difficulties understanding why the people around were calling them.

In these patients, due to the poor physical balance and lack of concentration on actions, assistance was provided with these symptoms considered as hazardous behaviors. In attempting to understand the acts, (which manifest as hazardous behaviors) and communication of these patients, consideration of a background of low cognitive ability in addition to agnosia and apraxia was thought to be necessary.

d) Group 4

These subjects fell asleep when there was no stimulation. Almost no physical movement could be observed. "I am all right. The illness is only mild. I shall be going home soon", they said.

In these subjects, total body care and also assistance that gave stimulation were provided. Even though the subjects had both low physical and cognitive abilities, conversation and care designed with consideration of agnosia and apraxia were thought to be necessary.

4) The classification by using physical ability and cognitive ability as X and Y axes almost coincides with the classification based on behavioral characteristics observed by the researchers. In addition, the validity of these classifications had been confirmed by ward doctors and nurses. Therefore, these classifications were considered to be reasonably reliable.

Discussion

In the present study, using the scattergrams constructed with BI and MMSE scores together with subjective and objective data associated with higher cerebral dysfunction, we classified subjects with higher cerebral dysfunction into 4 groups, and examined their characteristics.

In our subjects, the mean interval from disease onset

was 2.8 ± 2.0 months, which is the phase of appearance of higher cerebral dysfunction,[17,19] and the dysfunction observed is likely to occur in the usual course of patients with cerebrovascular diseases. Eleven of 12 patients had spatial neglect. The presence of "neglect" by itself has an adverse effect on the functional prognosis of the patients, as has been demonstrated in many previous reports[23-33].

Group 1 has high physical and cognitive abilities. The patients are aware of spatial neglect and are capable of adjusting their behaviors. This group responds to the care of arousing attention, and is able to direct their attention to the left side. They seem to have a certain level of awareness of the neglect and "bumping" because of neglect. They may be ranked as the typical group of patients with spatial neglect. For these subjects, nursing care of arousing attention to the left side for the purpose of improving spatial neglect is effective. However, these subjects may exhibit irrelevant behaviors out of their own interpretation. In these circumstances, behavioral observation should consider the potential attention disorder due to impaired cognitive function.

In group 2, the physical ability is low and cognitive ability is high. Because of the low physical ability and severe spatial neglect, these patients are frequently assisted and guided. However, these patients dislike such care. Since their cognitive ability is high and physical ability is low, the patients may feel frustrated with not able to perform acts satisfactorily. In these patients, we speculate that notwithstanding the level of cognitive ability, a lag between action and emotion arises easily. In such circumstance, the subjects have difficulties judging the next situation and how to restore the lag, and consequently cannot readjust the pace once again. Until now, their symptoms have been considered within the framework of "spatial cognition". However, besides "space", their cognition related to the time of situation change or the chronological time may be impaired. In addition, various types of unilateral spatial neglect have been reported[34,35]. Depending on the type, there may be a need to change the approach of nursing care.

It can be said that conventional nursing care has not focused on the characteristic of this group. Con-

ventional nursing care can be considered ineffective in this case, because by over-emphasizing on spatial neglect, one may in fact promote unpleasantness or the experience of failure in these patients. Instead, nursing care may have to consider the following : observe how attention is divided in order to avoid excessive calling or guidance to pay attention, avoid excessive calling and consider appropriate timing so as not to cause a confused state, wait and see how behavioral adjustment is made, and if successful tell the patient to motivate their feeling of success. Furthermore, consideration is required to make environmental changes to avoid accidents. Therefore, this group may suggest that the conventional care of "arousing attention" is not necessary effective.

These subjects also manifest symptoms of anosognosia and asomatognosia. These conditions occur commonly during the acute phase of cerebrovascular diseases, but rarely become chronic[36]. However, either symptom is an unfavorable factor for subsequent acceptance of disability and rehabilitation. Anosognosia has been reported to be an important prognostic factor for rehabilitation[37]. It is possible that because these subjects have difficulties perceiving the gap between their understanding of the disease or disability state and the reality, they fail to accept their actual disability[38,39]. They perceive no need for the assistance provided by the care providers and feel displeased with their care. For this reason, careful observations regarding the subjects' recognition of their own disability and the way they respond, and taking appropriate interventions are required. As mentioned before, since these symptoms appear during the acute phase, evaluation and interventions at an early stage are essential.

Group 3 has both low physical and low cognitive abilities. Because of the strong effect of agnosia and apraxia, actions are unrefined. Communication with others is impaired in a one-way manner. The subjects have difficulties communicating their emotions, have poor knowledge of their diseases, and probably have vague recognition of the situation. Since they cannot direct attention to the side of paralysis[37], self-care of the body especially of the left side is neglected. Since the subjects have difficulties controlling their own

attention, stimulation should be given on the right side which is relatively better perceived, and living environment should be adjusted. Evaluation of the degree of neglect and attention, and designing stimulation to the left side should be considered.

In this group, inattentive behavior, poor recognition of disease, and impaired emotional (psychological) state and communication are hindrances to social life rehabilitation in the future. In the hospital daily life setting, the interventions taken by nurses will influence the adaptation of the patient to these disabilities.

Finally, group 4 also is low both in physical and cognitive abilities. The subjects in this group complain little, and consciousness and activities cannot be maintained without stimulation. Because of the lowered cognition and physical abilities, actions characteristic of agnosia and apraxia are difficult to define. For this reason, observation and evaluation with consideration of agnosia and apraxia are required.

In this study, we used BI and MMSE scores and succeeded to group patients with agnosia and apraxia following cerebral vascular disease into 4 groups. Group 1 is a category reflecting conventional knowledge, and Group 2 is a new category that we found possessing new characteristics. Group 3 and 4 distribute close to each other, and are not distinguished by BI and MMSE scores, suggesting the necessity of other scales for their distinction. The present study also suggest the necessity to examine not only functional aspects such as BI and MMSE, but also difficulties in daily lives as a result of agnosia and apraxia. The limitations of the present study include a small number of subjects, as well as not including gender, age and duration after onset in the analysis. Future studies are required to include these items in analysis and also to explore other classification methods that allows grouping of subjects not distinguishable by BI and MMSE.

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