

Table 5. Patients' Characteristics of Nonadherence

患者属性	症 例						
	1	2	3	4	5	6	7
介護度	要介護 I	要介護 I	要介護 II	要介護 III	要介護 III	要介護 V	要介護 I
寝たきりの状態	寝たきりでない	寝たきりでない	寝たきりでない	ほとんど寝たきり	寝たきりでない	不明	寝たきりでない
家族構成	独居	独居	独居	独居	夫婦のみ	独居	独居
住居環境	一戸建て	集合住宅	集合住宅	一戸建て	一戸建て	入居系施設	一戸建て
薬の保管管理者	家族	自己管理	自己管理	介護スタッフ	家族	介護スタッフ	自己管理
薬の保管方法・場所	薬箱に入れ替え	お薬カレンダー	お薬カレンダー	お薬カレンダー	薬箱に入れ替え	薬箱に入れ替え	お薬カレンダー
調剤方法	ヒートのまま	全部一包化	全部一包化	全部一包化	全部一包化	全部一包化	全部一包化
看護師の訪問	無	有	有	有	無	無	無
医師の往診	有	有	有	有	有	有	無
訪問指導実施の経緯	不明	往診医師から依頼	薬局で必要性を把握し医師へ連絡	往診医師から依頼	ケアマネージャーから依頼	往診医師から依頼	家族から依頼

Table 6. Number of Patients by Whom Pharmacist Could Check Cognitive Function and/or ADL

	項 目	n
認知機能	短期記憶	25
	自立度	25
	意識状態の変動	24
	異常な興奮	25
	理解力	29
ADL	ベッド上の可動性	29
	移乗	31
	家の中の移動	30
	屋外の移動	26
	上半身の更衣	22
	下半身の更衣	23
	食事	31
	トイレの使用	31
	個人衛生	24
入浴	23	

10. 薬剤師による認知機能と ADL の把握状況

薬剤師により確認された患者の認知機能及び ADL の変化の総項目数を Table 6 に示す。認知機能について特筆すべき差はないが、ADL については確認できている割合の高い上位 3 項目は「移乗」、「食事」、「トイレの使用」であった。

また、t 検定の結果を Table 7 に示す。等分散性を確認した上でウェルチ検定の結果を採用した。「認知機能」に関して確認可能であった項目合計の

平均値は「自宅群」：4.31、「施設群」：2.58 と「自宅群」の方が有意に高かった (p=0.008)。また、ADL に関する項目においても「自宅群」：8.77、「施設群」：5.67 と「自宅群」の方が有意に高かった (p=0.006)。

考 察

認知症治療薬を服用している患者を対象とした薬剤師による訪問薬剤管理指導は、往診医師からの依頼以外にも、家族、ケアマネージャーや介護スタッフからの要請、さらには、薬剤師から医師への自発的な働きかけが契機になっていることがわかった。患者の服薬状況は概ね良好で、この背景には、訪問薬剤師による薬カレンダーの作成、薬箱への入れ替え、一包化などの手段による服薬支援が効を奏していることが推察される。

服薬状況との関連要因として、「住居環境」や「居宅における薬の保管管理者」が挙げられ、施設入居者や、施設関係者が服薬管理をしている患者の服薬状況が良好であることが示唆された。一方、服薬アドヒアランスの不良な患者は「独居」、「薬を自己管理している」、「一戸建て住居に居住している」という傾向が示唆されたが、上記に挙げた服薬状況の関連要因とも対応していた。

認知症患者の服薬アドヒアランスとの関連要因に特化した研究では、患者の性別、年齢、薬剤費に係

Table 7. The Number of Items That Pharmacist Confirmed for "Acknowledgment Function" and "ADL" Compared by Domiciliary Environment

	住居環境	平均値		等分散性のための Leveneの検定		t値	有意確率 (両側)	差の 標準誤差	差の95% 信頼区間	
				F値	有意確率				下限	上限
認知機能	自宅(13)*	4.31	等分散を仮定する	18.664	0.001	2.447	0.020	0.705	0.294	3.155
	施設(24)	2.58	等分散を仮定しない			2.834	0.008	0.609	0.488	2.960
ADL	自宅(13)	8.77	等分散を仮定する	8.386	0.006	2.497	0.017	1.243	0.580	5.625
	施設(24)	5.67	等分散を仮定しない			2.918	0.006	1.063	0.944	5.261

*()中の数値は人数を表わす。

る経済的負担¹⁷⁾、家族の協力¹⁸⁾等が影響しているとの報告がある。性別、年齢、経済的負担については、本研究の調査項目に含んでいないため、検証は今後の課題として残るものの、家族の協力については、本研究においても関連要因として浮上した「独居」、「居宅における薬の保管管理者」と類似した結果が得られたものと評価している。

さらに、薬剤師が訪問した際、施設入所者に比して自宅療養患者の方が、患者の認知機能や身体機能についてより多くの項目を確認できていることが示唆された。このことから、施設入居者では、服薬に起因した認知機能の低下や身体機能の悪化を薬剤師が確認し難いというリスクが潜在する可能性が示唆された。

訪問薬剤管理指導を受けている認知症治療薬服用患者の属性把握及び服薬状況との関連要因について精査を試みたが、事例数の制約から一般化に足る傾向を明示するには至らなかった。また、認知機能やADLの確認ができるか否かの差は、患者の住居環境だけでなく、薬剤師自身の資質の違いに起因する可能性も否めない。しかし、本調査では薬剤師属性に関する調査項目は含まれておらず、検証には至らなかった。これらの反省をふまえ、今後はさらに事例数及び調査項目を追加したうえで、より精度を高めた調査研究を継続したいと考えている。

結 論

訪問薬剤管理指導を実施している認知症治療薬服用患者の服薬状況の良否には、住居環境や薬の保管管理者が関連していることが示唆された。一方で、施設入居者の服薬状況自体は良好であっても、服薬による問題点発見の機会において自宅療養患者と差があることが示唆された。以上から、薬剤師は施設

入所者に対しても、より積極的に訪問薬剤管理指導の業務内容を充実させることが肝要であると考えられる。

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■ 患者背景と生活環境を考慮した在宅での薬学管理 —— ①

服薬管理能力

Key Points

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- ⊕ 認知症患者の服薬アドヒアランスには、治療薬に対する患者や家族の満足度、患者と医師(医療者)との関係なども影響する。
- ⊕ 認知症治療の現場では、医師、患者、家族いずれも服薬管理に関する専門家の関与を必要としている。
- ⊕ 薬剤師による薬学的な管理指導の内容に対する理解度が高いケアマネジャーは、ケアプランへ管理指導を組み入れる傾向にある。
- ⊕ 薬剤師は、他職種や家族では見逃しがちな患者の日常生活動作、quality of lifeに対する薬の影響を評価し、薬物治療の適正化に向けた支援を行う。
- ⊕ 薬剤師が医師と患者情報を共有しながら処方を極力簡素化することにより、認知症患者とその家族へのケアに貢献できる。

在宅認知症患者にかかわる
薬物治療の課題

厚生労働省の統計値によると、日本の総人口に占める65歳以上人口の割合は、2015年に25%を超えると推定されており、認知症患者数も11.1万人(1996年)から38.3万人(2008年)と急増している(図1)。

認知症治療では、薬の継続的な服用が重要であり、服薬アドヒアランスの維持が治療効果、ひいては、患者・介護者双方のquality of life (QOL)改善の鍵を握っている。わが国の臨床現場において、アルツハイマー型認知症の治療にもっとも長い使用実績を有するドネペジルを例にとると、ドネペジルの服薬が初診のアルツハイマー型認知症患者と介護者

のQOLにもたらす効果を検討した調査では、患者・介護者双方でQOLが改善したことが確認されている¹⁾。また、ドネペジルの投与によりアルツハイマー型認知症の言語記憶機能障害の進行は抑制されないが、注意・集中力および情報処理能力・速度の低下が抑制されるとの報告がある²⁾。

このように、ドネペジルの臨床効果は複数の調査研究で実証されているが、アドヒアランスの維持が難しいとの指摘もある。大学附属病院内で実施された後ろ向き調査では、調査対象患者の53.1%が2年間の調査期間中にドネペジルの服用を中断しており、中断の主な理由として、主治医の変更、無効、消化器症状に関連する副作用の発現をあげている³⁾。また、別の調査では、3ヵ月以上投与を継続

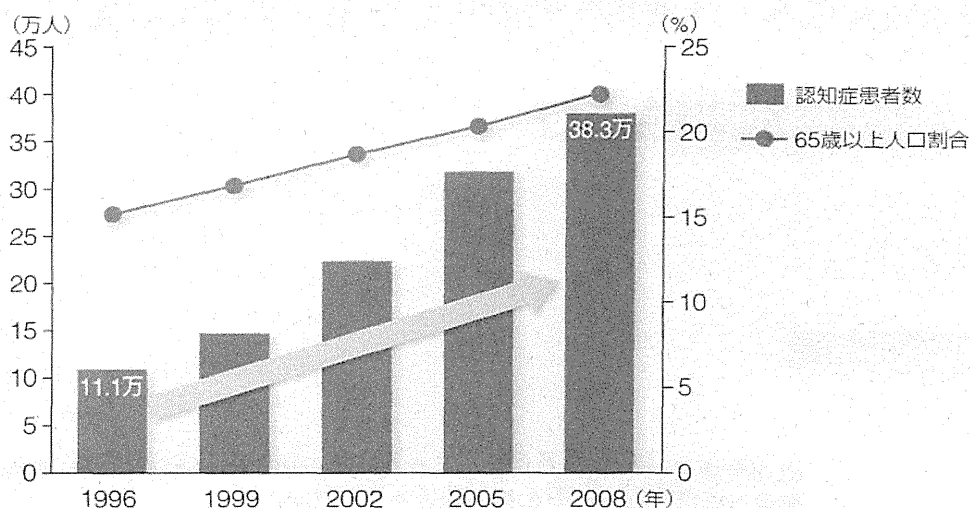


図1 65歳以上人口割合および認知症患者数の推移

(厚生労働省統計より作成)

したケースで、調査対象になった家族の約半数が、記憶の改善よりも意欲の改善や情緒の安定を評価していた一方で、服用を開始してから3ヵ月以内に中断するケースでは、中断理由として頭痛や気分不快などによる服薬拒否、易怒・興奮・不穏、幻覚妄想状態の悪化などをあげている⁴⁾。

一般的に、服薬アドヒアランスとの関連要因としては、年齢、疾病の重症度、合併症、処方内容、後発医薬品への代替などがあり、自己判断による服薬中断の理由として、服薬の必要性に対する認識不足が指摘されている。一方、認知症患者の服薬アドヒアランスには、認知機能障害の程度、「服用しやすさ」を含めた治療薬に対する患者や家族(介護者)の満足度、家族の協力、患者と医師(医療者)との関係なども影響するため、医療関係者には、薬物治療の効果と安全性を確保するための幅広くきめ細やかな対応が求められる。

医療・介護現場からの 薬剤師へのニーズ

認知症治療の現場では、患者のうち30%はかかりつけ医に認知症と診断され、診断後、53%はかかりつけ医院で治療を継続しており、医師は患者の服薬管理に困っているとのデータがある⁵⁾。また、認知症外来に初診で訪れた患者や家族の情報ニーズに関する調査では、全体の半数以上が服薬管理や金銭管理に何らかの介助を必要としていることが確認されている⁶⁾。さらに、認知症高齢者が居住するグループホームでは、ケア責任者の半数が不安を感じている内容が「与薬についての判断(とくに頓服薬の使用)」であるにもかかわらず、3割のグループホームにおいて、ケア担当者が与薬について医療者に終日相談できる体制になっていないとの報告がある⁷⁾。

以上のような背景を踏まえると、薬剤師が認知症患者や家族を支援するために関与できる内容は多岐にわたっており、積極的な取り組みによる成果が期待できる。実際に、薬局

薬剤師が注意深く患者情報を収集し、認知症や薬物治療に対する患者・家族の理解を高めることに主眼をおいた服薬指導を行うとともに、介護者の与薬負担を軽減するために医師と患者情報を共有しながら処方箋の簡素化を図ることで、認知症患者とその家族へのケアに貢献できたことが示唆されている⁸⁾。とくに、向精神薬の変更時などは、患者の状態に留意し、中核症状の状態に応じた支援を行うことにより、BPSD (behavioral and psychological symptoms of dementia) を軽減できる可能性も示唆されている⁹⁾。また、ドネペジル内服ゼリーのニーズに関する評価調査では、60%の介護者が在宅認知症患者の与薬時の負担として「拒薬」をあげていることもあり、服薬ゼリー使用のメリットとして、「服薬しやすさ」による服薬アドヒアランスの向上や介護者の「与薬しやすさ」が報告されている¹⁰⁾。

実効ある服薬管理を実現するために (今後薬剤師が取り組むべき課題)

1 キーパーソンとの連携強化による タイムリーな問題把握

薬剤師が単独で認知症患者や家族から必要な情報を収集し、かつタイムリーに関与するには限界があり、他職種との協力が不可欠である。医師、訪問看護師のほか、患者宅を頻繁に訪れ日常生活を支援しているホームヘルパーは、患者の生活背景や服薬状況をもっとも身近で把握し得る重要なキーパーソンである。したがって、服薬状況に問題を感じた時には、遠慮なく薬剤師に連絡してもらえよう。日頃からホームヘルパーとの交流に努めることによって、服薬状況をタイムリーに把握することも有効である。

一方、居宅を訪問した際に、ホームヘルパーが次のような事項を認識した場合には、患者

の服薬率を実際より低く見積もる傾向にあるとの報告がある¹¹⁾。

- ①患者の認知力低下を感じている。
- ②朝食や昼食を抜いた時に薬を飲まないことがある。
- ③自分の意思で薬を飲まないことがある。
- ④家の中に多くの薬が残っている。

したがって、今後薬剤師は、ホームヘルパーからの情報を参考に、重点的に関与すべき患者を抽出し、各種ツール(たとえばMEMS (medication events monitoring system) や、モリスキースケールなどの自己記入式評価尺度など)を用いて服薬状況を客観的に評価し、調剤方法の工夫や分割調剤などを有効活用することで服薬アドヒアランスの改善に努めることが求められる。

2 薬物治療にかかわる潜在的リスクの 把握と効果的な関与

服薬アドヒアランスの確保とともに、今後薬剤師が積極的に関与すべき事項として、薬物治療の潜在的リスク (potentially inappropriate medication ; PIM) の把握と、それに対する効果的な介入がある。海外の報告では、薬剤師が65歳以上の在宅療養患者の薬剤調査 (home medicines review HMR) を実施し、2003年版Beer's Criteriaに照らして催眠鎮静薬および抗コリン薬に起因するPIMの抽出を試み、薬剤師の介入による改善効果を客観的に評価している¹²⁾。筆者らが、認知症治療のためドネペジルを服用している患者を対象にして実施した調査¹³⁾でも、65歳以上の調査対象者の総処方件数に占める抗不安薬および催眠鎮静薬の処方件数の割合は約40%であったことから、今後国内においても、PIMの実態把握とそれに対する薬剤師の関与について、具体的かつ実践的な手法を考案することが必

要ではないかと考える。

また、訪問薬剤管理指導を受けている認知症治療薬服用患者を対象にした予備的調査¹³⁾では、患者の服薬状況はおおむね良好で、この背景には、訪問薬剤師による薬カレンダーの作成、薬箱への入れ替え、一包化などの手段による服薬支援が功を奏していることが確認された。また、服薬状況との関連要因として、「住居環境」や「居宅における薬の保管管理者」があげられ、施設入居者や、施設関係者が服薬管理をしている患者の服薬状況が良好、逆に服薬アドヒアランスの不良な患者は「独居」「薬を自己管理している」「一戸建て住居に居住している」という傾向にあることが示唆された。

一方、薬剤師が訪問した際、施設入所者に比べて在宅療養患者のほうが、患者の認知機

能や身体機能についてより多くの項目を確認できていることが示唆された¹³⁾。このことから、施設入居者では、服薬に起因した認知機能の低下や身体機能の悪化を薬剤師が確認しにくく、服薬状況自体は良好であっても、服薬による問題点発見の機会において在宅療養患者と差があることが懸念される。

以上から、薬剤師は施設入所者に対しても、より積極的に訪問薬剤管理指導の業務内容を充実させることが重要ではないかと考える。

3 訪問業務の機会拡充

全国18の都道府県から768人のケアマネジャー（CM）の協力を得て行った調査¹⁴⁾では、薬剤師による管理指導をケアプランへ組み入れた経験を有していたCMは全体の24%、薬剤師がケアプランにかかわることが必要と回

表1 在宅介護に関する薬剤師業務の認知度および必要性(意識)

業務(略称) [*]	N	認知度(%)	必要であると強く思う(%)	必要であると思う(%)	どちらともいえない(%)	必要だと思わない(%)	まったく必要だと思わない(%)
①薬の宅配	574	68.3	27.7	42.0	27.2	1.9	1.2
②薬の整理整頓	577	55.8	36.4	40.9	20.3	1.6	0.9
③服薬相談	581	86.4	41.1	41.8	15.7	1.2	0.2
④医療機器(材料)の供給	564	22.9	20.9	35.3	36.0	5.0	2.8
⑤褥瘡ケア	558	34.4	26.9	38.7	28.7	3.0	2.7
⑥処方提案	576	67.9	49.1	35.4	14.4	0.9	0.2
⑦カンファレンスへの参加	571	43.6	32.6	37.3	26.6	2.5	1.1
⑧臨時訪問、相談応需	576	32.6	32.1	39.6	24.3	3.0	1.0
⑨居室の衛生管理	574	29.4	26.5	38.7	30.3	3.7	0.9

略称※ 業務内容

①薬の宅配：定期的に利用者宅を訪問し薬をもって来る

②薬の整理整頓：居室内の薬の整理整頓や残った薬の処理などをする

③服薬相談：利用者や家族と直接話をして、服薬に関するいろいろな相談を受ける

④医療機器(材料)の供給：吸引機や吸入器などの医療機器や販売やレンタル、およびそれにかかわるカテーテル類などの医療材料の販売をする

⑤褥瘡ケア：褥瘡の状態に応じて医薬品や医療材料の提案をする

⑥処方提案：副作用や相互作用をチェックし、副作用の可能性があれば医師と相談し、処方を提案する

⑦カンファレンスへの参加：退院する際のカンファレンスに参加する

⑧臨時訪問、相談応需：ケアプランに組み込んでいなくても臨時的に訪問し、医療保険の一部負担で薬の整理や患者の相談を応需できる

⑨居室の衛生管理：消毒薬や衛生材料の相談や販売をしたり、また居室内や施設内の消毒や衛生管理のアドバイスをする

(文献15)より著者作成)

答したCMは全体の57.4%、管理指導の内容について理解していると回答したCMは全体の25.9%であった。管理指導をケアプランへ組み入れた経験の有無に関連していたのは、管理指導の内容に対するCMの理解度であり、理解度が高いCMはケアプランへ管理指導を組み入れる傾向にあることが確認された。

管理指導の具体的な項目ごとにCMの認知度および必要性(薬剤師が居宅で実施する必要があるとの意識)について質問したところ、「①薬の宅配」、「②薬の整理整頓」、「③服薬相談」、「⑥処方提案」の4業務において認知度が50%を超えていたが、「④医療機器(材料)の供給」、「⑤褥瘡ケア」、「⑦カンファレンスへの参加」、「⑧臨時訪問、相談応需」、「⑨居室の衛生管理」の5業務では認知度が50%未満であった。また、必要性については、すべての業務について“必要性あり”との回答が50%を超えており、もっとも“必要性あり”との回答が多かったのは「⑥処方提案」(84.5%)で、もっとも低かったのは「④医療機器(材料)の供給」(56.2%)であった。また、管理指導

の項目別認知度と必要性(意識)との対応をみると、すべての項目において、認知度が高いと必要性(意識)も高いという結果であった(表1)¹⁵⁾。

一方、管理指導をケアプランに組み入れる意思はあったが実際には組み入れられなかった主な理由として、「家族が薬剤師の訪問のメリットを理解できなかった」「他の職種が薬を持ってくるので必要ない」との回答が上位を占めていた(図2)¹⁴⁾。

以上から、今後薬剤師は、居宅療養管理指導が単なる「薬の宅配」ではなく、他職種や介護者では見逃しがちな患者の日常生活動作、QOLに対する薬の影響を専門的な目で評価しつつ、薬物治療を適正に行うために必要な支援を行うものであるということを再認識することが必要であろう。そして、日常業務を通じたCMや患者・家族との接点を最大限に活用し、薬学的な管理指導への理解を深めてもらうことにより、訪問業務の機会を拡充していくよう努めることが求められているのではないかと考える。

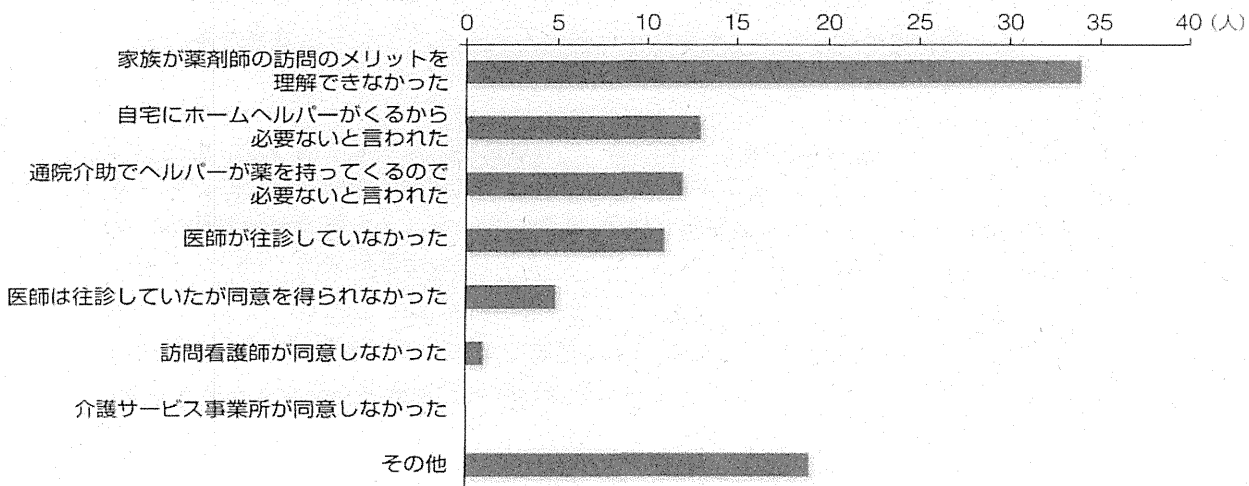


図2 ケアマネジャーが管理指導をケアプランに組み入れられなかった理由(複数回答: N=74)

(文献14)より引用)

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information

東京理科大学 第28回 薬学講座

期 日：2012年10月20日(土) 10:30～17:00
会 場：東京理科大学神楽坂校舎1号館17階記念講堂
主 催：東京理科大学生涯学習センター、東京理科大学薬学部同窓会、公益財団法人日本薬剤師研修センター、文部科学省がんプロフェッショナル養成基盤推進プログラム採択事業

プログラム

- ・原発事故に伴う環境の放射能汚染と人体影響 (東京理科大学薬学部 教授)小島周二
- ・スポーツファーマシストとアンチ・ドーピング活動 (東京都薬剤師会 副会長)原 博
- ・今後の薬剤師像 (医薬品医療機器総合機構 審査マネジメント部 部長)磯部総一郎
- ・個別化医療と*in silico*創薬 (理論創薬研究所 所長)吉森篤史

日本薬剤師研修センターの単位認定(3単位)を希望する方は事前に下記HPからお申し込みください(インターネットを使えない方は下記へご連絡ください)。受付締切は2012年10月10日(水)とさせていただきます。なお、単位認定が不要な方の事前申込は必要ありません。

お問い合わせ先

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Factors Related to Medication Adherence of Cognitively Impaired Patients in Community Pharmacies

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ABSTRACT

Objective: The objective of the study was to identify factors related to donepezil medication adherence (“adherence”) of cognitively impaired patients in community pharmacies. **Methods:** One hundred and twenty community pharmacies in 28 regions in Japan were randomly selected. Questionnaires were mailed to these pharmacies. The pharmacists answered based on the medication profiles (“YAKUREKI”) of the patients given donepezil at their pharmacies. The survey items were “adherence”, “who is the key person” and the key person’s understanding and awareness of donepezil and its symptoms. The χ^2 test and decision tree modeling analysis were performed to examine factors affecting adherence. A 5% level of statistical significance was used in the χ^2 test. **Results:** Questionnaires with data on 479 patients were returned. The most common level of adherence was “take as instructed” (81.2%), followed by “forget once or twice a week” (10.2%). The χ^2 test revealed that adherence was good if “key person” was professional caretaker ($P = 0.004$). Also, adherence was better if key person understood medication about dosage, $P < 0.001$; effect, $P = 0.002$; and general side effects, $P < 0.001$. According to decision tree analysis, the key person had the strongest relationship with adherence. **Conclusions:** It was confirmed that the key person’s understanding of the medication and symptoms of cognitive impairment are related to adherence. In particular, it was suggested that there is a strong relationship between the key person and adherence and that factors related to adherence differ according to who the key person is. It is essential in the treatment of cognitive impairment to accurately identify the “key person”, in order to provide better pharmaceutical care in community pharmacies.

Keywords: Japan; Pharmacist; Community Pharmacy; Medication; Adherence; Cognitive Impairment

1. Introduction

It is estimated that over 25% of the Japanese population will be 65 years of age or older by 2015. The Japanese Ministry of Health, Labor and Welfare estimated that the number of people 75 years of age and older would be about 14 million in 2009 [1]. About 120,000 out of these people will have cognitive impairment [2].

We know that it is essential for medication to be taken continually in the treatment of cognitive impairment and that maintaining treatment adherence is the key to improving the quality of treatment and the quality of life [3]. There is an abundance of research on factors related to medication adherence (“adherence”) worldwide. It has been suggested that such factors include age [4,5], sex [6], economic status [5], disease severity [5], degree of cognitive dysfunction [7], complications [5,8], drug regimen prescribed [6,9], cooperation from family [10],

physician-patient relationship [7,11], patient satisfaction [12], and generic substitution [13]. Inadequate awareness of the necessity to follow the treatment regimen has been identified as a reason for the patient’s decision to discontinue treatment of their own accord [4].

Research on adherence in patients with cognitive impairment includes studies on factors such as persistence (refill adherence) and duration for multiple cholinesterase inhibitors [14-16]. These studies suggest that the type of drug and ease of use affect continuation or discontinuation of treatment [18], and that the sex, age, and degree of economic burden from medication costs affect adherence to treatment regimens for cognitive impairment [17]. A study compared treatment adherence in outpatients for multiple medications for cognitive impairment (multiple cholinesterase inhibitors) [18,19]. Belle SH *et al.* inspected the influence of medication for cognitive enhancement on family care-givers, and suggested that there is substantial geographic variability and effects de-

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pending on the physician's education [20], Sevilla C *et al.* compared satisfaction of the care-givers on cognitive impairment medications prescribed for the patient [21].

There are no studies on adherence of cognitively impaired patients, but several studies examined the adherence on medication for some diagnoses in Japan. Hayashi *et al.* identified irregularity of meals as a factor related to adherence in a survey of inpatients with ischemic heart disease, by checking whether or not patients forgot to take their medication on a 2-grade yes/no scale [22]. Ishida *et al.* demonstrated the beneficial effect of one dose packaging in an evaluation of adherence to an oral antidiabetic drug regime based on whether diabetics could take their medication per physician's instructions (evaluated on a three-grade scale of "I am taking medication," "sometimes forget," and "often forget") [23]. Yamaoka *et al.* evaluated adherence to a α -glucosidase inhibitor on a four-grade scale ("take all as instructed," "usually take," "sometimes take," and "don't take") and demonstrated that adherence was lower than with other oral antidiabetic agents [24]. Tatemichi *et al.* demonstrated that adherence improved according to the instructions given by physician in an evaluation of long-term adherence in male Japanese workers using a four-grade scale (always took the drug according to the prescription (complete), occasionally forgot to take the drug (good), frequently forgot to take the drug (poor), always forgot to take the drug (very poor)) [25]. Evaluating adherence on a four-grade scale for forgetting to take medication or having left-over medication ("happens a lot," "sometimes happens," "doesn't happen very often," "almost never happens"), Kamei *et al.* identified occupation and having diabetes as factors affecting adherence [26].

Most of the previous research in Japan has been performed at specific medical institutions or in specific communities; none has been performed on patients with cognitive impairment over a wide area in a community pharmacy setting. The purpose of this study is therefore to identify factors related to adherence of cognitively impaired patient.

There are several assessment methods for adherence, mainly consisting of pill counting methods such as the MEMS (Medication-Event-Monitoring System) [27], and self-administered rating scales such as the Morisky Scale, which assesses adherence by scoring the frequency with which patients forget to take medication or discontinue their medication [28]. Hiratsuka *et al.* studied the validity of the 4-grade Drug Compliance Scale (DCS), consisting of 4 items, by using it in combination with pill counting; however, their study suggested that only 2 of the items were valid [29]. Nevertheless, pill counting devices such as the MEMS are not widely available in Japan, nor are Japanese translations of assessment tools such as the Morisky Scale widely accepted. Thus, while several

methods for assessing adherence are available in Japan, a unified assessment method has not been established.

We therefore performed a pilot study of assessment scales among pharmacists and selected the most universally used assessment scale for use in the present study. The assessment tool selected is a patient profiling system that is used by pharmacies throughout Japan for collecting data on adherence and related factors across multiple geographic regions.

This profiling system in Japan is called the "YAKUREKI". Regulations concerning the "YAKUREKI" mandate community pharmacists to "record data for monitoring and counseling patients". Information to be recorded is specified by the Japanese Health Insurance Law (Table 1). Since Japanese pharmacies do not have technicians or other certified support staff who dispense drugs and provide medicine work, pharmacists are the only ones who deal with patients. As a result, several different pharmacists often work on the same cases. The purpose of the "YAKUREKI" profile is for pharmacists to share information on patients in order to maintain the quality of pharmacists' counseling.

Table 1. Items to be included in "YAKUREKI" under the Rule of Pharmacies Dispensing Fee Schedule.

No.	Items
1	Patient data (name, age, address, gender, health insurance number)
2	Prescription data (hospital name, physician's name, date of issue, contents)
3	Dispensing data (date of dispensing, dispensing method, contents referred to hospital)
4	Patient's general condition (allergy, history of side effects, kidney/liver diseases, severe diseases)
5	Detailed information of patient and/or caregivers' inquiry
6	The status of adherence
7	Changes in health condition or symptoms while under drug treatment
8	OTC and/or dietary supplements currently taken
9	Possibility of disease complication
10	Other medications or hospital/clinic visits
11	Potential side effects
12	Potential food-drug and/or drug-drug interactions
13	Name of counseling pharmacist
14	Change in medications
15	Pharmacist's assessment
16	Problems related to medication
17	Contents of counseling and guidance by pharmacists
YAKUREKI Fee targets = 1 - 13	
Pharmaceutical counseling fee targets = 14 - 17	

Keeping medication records using “YAKUREKI” has been required as standard skill for community pharmacists by Health Insurance Law in Japan.

So, the training for handling “YAKUREKI” is one of the core-requirements in undergraduate program.

A schematic depiction of the research protocol appears in **Figure 1** below.

In general, the target patients with cognitive impairment are identified by checking the disease name on their prescriptions. But in Japan, no prescriptions carry disease names, so the only way to select patients with cognitive impairment is by checking the medication contents. In Japan, donepezil HCl is used in symptomatic treatment that controls the progression of cognitive disorders including dementia of the Alzheimer’s type (AD), mild cognitive impairment (MCI), and dementia with Lewy bodies (DLB). This acetylcholinesterase inhibitor was the only drug approved in Japan for the treatment of cognitive impairment when this study was conducted at the end of June 2010.

2. Subjects and Methods

2.1. Subjects and Survey Methods

One hundred and twenty community pharmacies in 28 of the 47 regions throughout Japan were randomly selected using the Domestic Sales Data of Donepezil for the survey. These establishments were selected from among pharmacies that had dispensed donepezil using random number generated by computer.

This number of pharmacies was calculated based on the assumption reached by our pilot study that there would be data from 100 patients (50 in the “good” ad-

herence group and 50 in the “poor” adherence group), with a response rate of 50%, and that data from 2 patients could be obtained per pharmacy. Pharmacies were provided with a general explanation of the survey and pharmacies with no patients taking donepezil were excluded.

The questionnaire consisting of 20 items in 10 domains (**Table 2**) was mailed to the supervising pharmacists at the participating pharmacies. Pharmacists who had counseled patients on the use of donepezil were requested to record and evaluate information in these patients’ profiling system (“Yakureki”) in the questionnaire. The completed questionnaire forms were returned by mail. The questionnaire was based on a review of previous studies, cognitive impairment treatment guidelines, and information gleaned from meetings with academics and pharmacists. The questionnaire was then reworked into its present state after a pilot study using 5 pharmacists. So that care-giver and familial recognition influence it for cognitive impairment medical treatment [30], We should conduct an investigation into recognition of care-giver in an item of this study, We have to describe “key person” because we set this research based on recording of interview at counter in community pharmacy as investigation subject, therefore the degree of care-giver is various by degree of cognitive impairment, it is difficult to make judge who is care-giver at counter in community pharmacy because of various person coming to receive medicine.

2.2. Statistical Methods

The χ^2 test was performed using the level of adherence and other survey items. Adherence was categorized as

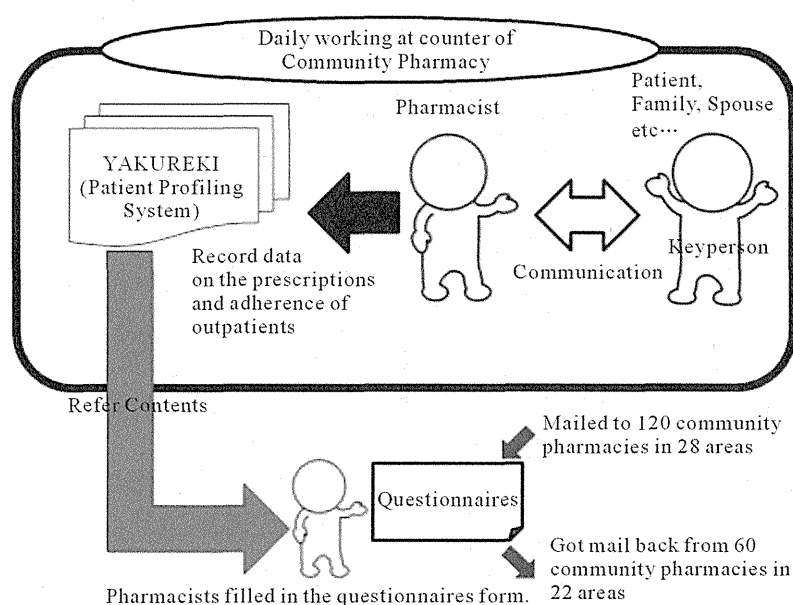


Figure 1. Process of study.

Table 2. Questionnaire items (20 items, 10 domains).

	1-a). Sex	
1) Patient profile	1-b). Age	
	1-c). Medical institution visited	
	2-a). Donepezil strength	
	2-b). Dosage form	
2) Regimen prescribed	2-c). Dosage	
	2-d). Supply dispensed per prescription	
	2-e). How dispensed	
	2-f). Concomitant drugs	
3) Physician's consultation status		
4) Donepezil adherence		scored on a four-grade scale
5) "Key person" who has the central role in overseeing the donepezil adherence		
	6-a). Understanding of donepezil administration and dosage	scored on a four-grade scale
6) Key person's understanding of donepezil	6-b). Understanding of effect	scored on a four-grade scale
	6-c). Understanding of general side effects	scored on a four-grade scale
7) Key person's understanding of cognitive impairment	7-a). Understanding of the characteristic symptoms of cognitive impairment	scored on a four-grade scale
	7-b). Understanding of the treating physician's treatment plan	scored on a four-grade scale
8) Key person's awareness of own cognitive impairment		scored on a four-grade scale
9) Key person's awareness of therapeutic effect		scored on a four-grade scale
10) Key person's attitude toward treatment (positive/negative)		scored on a four-grade scale

“good” (“take all as instructed”) or “poor” (“forget once or twice a week,” “only take once or twice a week,” “never take”). “Information unavailable”, “unknown,” and “no response” were excluded as missing data. The following factors were each divided into 2 groups: age (≤ 74 years and ≥ 75 years), supply dispensed per prescription (in days) (≤ 29 days and ≥ 30 days), and number of concomitant drugs (≤ 4 and ≥ 5). “Key person” was divided into 4 groups: patient, spouse, family member other than spouse, and professional caretaker (Table 3). The decision tree analysis was performed, using adherence level as the target variable and items suggested by the χ^2 test to be related to adherence as independent variables.

Of the various methods of decision tree analysis, we used CRT (classification and regression trees). In the CRT analysis, a branch splits in two at the cutoff point showing the largest change in impurity found by Gini measurement among a combination of cutoff points for all independent variables used (“Impurity” refers to the extent to which responses are concentrated in a single target category in a node). This process then repeats itself. The “good” adherence group was selected as the target

category. The minimum number of cases per group before running the analysis (the parent nodes) was set at 100 and the minimum per group after running the analysis (the child nodes) was set at 50. The analysis was considered completed when a minimum of 100 cases in the parent node and 50 cases in the child node was reached. The Windows versions of SPSS (18.0J) and SPSS Decision Tree software packages were used in the analysis. A level of significance of less than 5% was used.

3. Results

3.1. Questionnaire Return Rate

Four-hundred-and-seventy-nine patient data responses were collected from 60 community pharmacies in 22 regions throughout Japan (Figure 2).

3.2. Results

The results of each of the questionnaire items are shown in Table 4 and Table 5.

More than half of the patients visited a “clinic or physician’s office” for treatment. 79.1% of the patients were prescribed a 5 mg tablet once daily, with treatment

Table 3. Items and groups used in the χ^2 test.

Questionnaire item	Response	Group
Medical facilities patient visited	University hospitals	Hospital
	Public hospitals	
	Private hospitals	
Physician's consultation status	Clinics or physician's offices	physician's office
	Patient sees physician	Patient sees physician
Dispensing methods of Donepezil	Patient only gets medication w/o seeing physician	Patient only gets medication w/o seeing physician
	Alone in a heat-sealed packet	Donepezil alone
	One-dose packages alone	One dose packaging
Key person's understanding (dosage, effect, general side effect)	One-dose packages with other drugs	Understands
	Understands well	
	Mostly understands	Does not understand
	Does not understand very well	
Key person's awareness of own cognitive impairment	Does not understand at all	Aware
	Well aware	
	Generally aware	Not aware
	Not very well aware	
Key person's awareness of therapeutic effect	Completely unaware	Has awareness
	Has a thorough awareness	
	Has a general awareness	Does not have awareness
	Does not have a very good awareness	
Key person's attitude toward cognitive impairment treatment	Has no awareness	Positive
	Positive	
	Somewhat positive	Negative
	Somewhat negative	
	Negative	

regimen stating "to be taken after breakfast". There was an average of 3.1 concomitant medications.

77% of the patients were accompanied by someone when visiting their physicians. 10% visited their physicians for treatment alone. This information was not clear for 12% of the patients.

81.2% of the patients were found to be adherent. A family member other than the spouse was the most common "key person", followed by the spouse, the patient himself/herself, and a professional caretaker, in that order.

There were common tendencies in the key person's understanding of donepezil and cognitive impairment, as well as the awareness of own cognitive impairment. The most common degree of understanding was "mostly un-

derstand", followed by "well", "not very well", and "not at all", in that order.

As for the therapeutic effect, the most common response was "do not have a very good understanding" followed by "have no understanding".

Concerning the attitude toward treatment, there was a common tendency on the understanding and awareness on the part of the key person: "unknown" was the highest at 35.9%.

3.3. Factors Affecting Adherence to the Donepezil Regimen

The χ^2 analysis of the key person's relationship to adherence to the donepezil regimen revealed that a higher per-

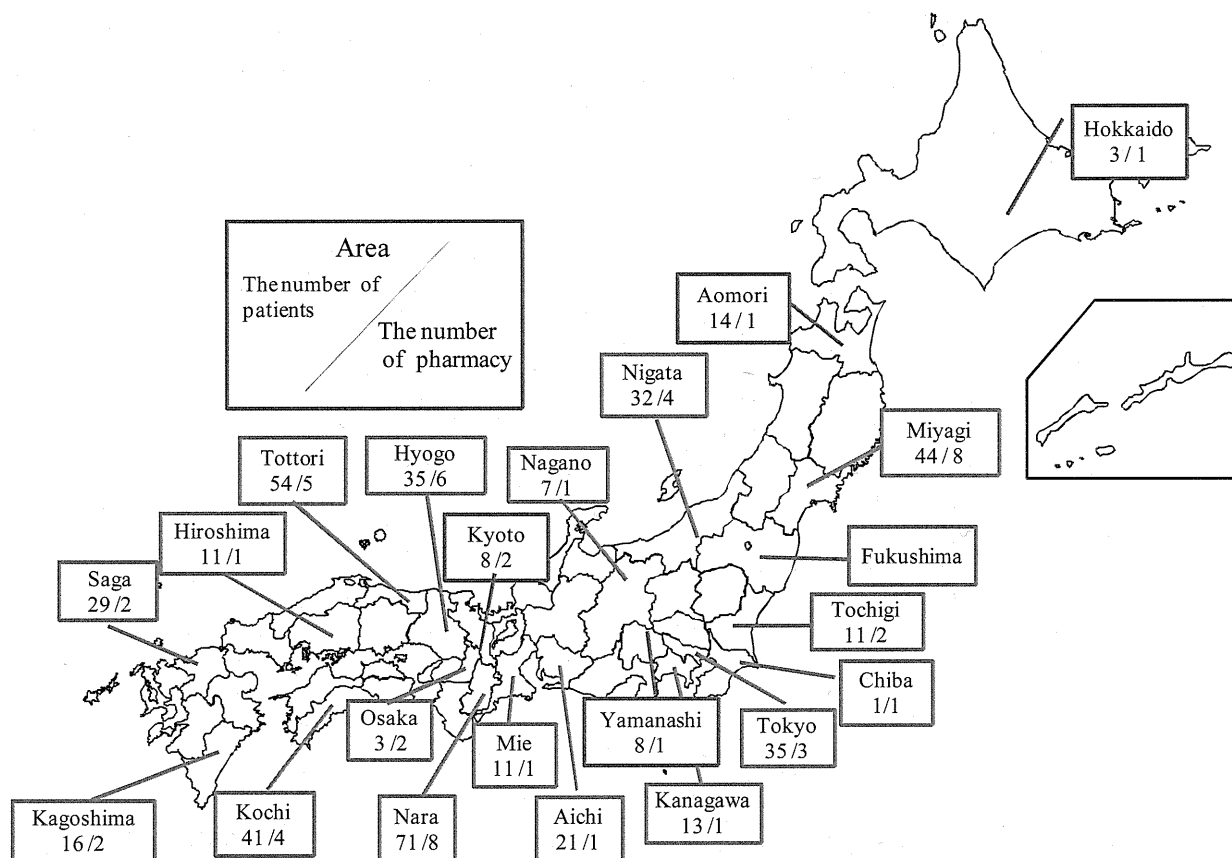


Figure 2. Distribution of responses.

centage of patients with “a professional caretaker” had “good” adherence than patients with the other three key person types, whereas a lower percentage of patients with “a family member other than the spouse” as the key person showed “good” adherence than patients in the three other key person types ($P = 0.004$) (Table 6). The χ^2 test was also used to compare patients with themselves (“patients”) as the key person with those with “a professional caretaker” as the key person, revealing a higher rate of “good” adherence when “a professional caretaker” was the key person ($P = 0.034$).

The χ^2 analysis of the relationship between adherence and the key person’s understanding of donepezil revealed that a higher percentage of “good” adherence was seen when the key person “understands,” compared to when the key person “does not understand” all donepezil-related items (administration and dosage, $P < 0.001$; effects, $P = 0.002$; general side effects, $P < 0.001$).

The results for the χ^2 analysis of other factors related to donepezil adherence are discussed below. The key person’s understanding of cognitive impairment: There were significant differences for understanding of both “characteristic symptoms” and “physician’s treatment plan.” A higher percentage of “good” adherence was seen when the key person “understands” than when the

key person “does not understand” ($P < 0.001$). The key person’s awareness of patient’s illness: There was a higher percentage of “good” adherence when the key person was “aware” than when he/she was “not aware” of patient’s illness ($P = 0.001$). Key person’s awareness of therapeutic effect: There was a higher percentage of “good” adherence when the key person “is aware” than when the key person “is not aware” of the therapeutic effect ($P = 0.001$). Key person’s attitude toward cognitive impairment treatment (positive/negative): There was a higher percentage of “good” adherence when the key person was “positive” than when the key person was “negative” about treatment ($P < 0.001$). The factors sex, age, medical institution visited, regimen prescribed, and whether patient personally sees physician to get prescription did not show a relationship with adherence.

3.4. Building the Decision Tree Model

There were 418 subjects in the analysis, after excluding patients for whom the “information was unavailable” or there was “no response.” Figure 3 shows the results of the decision tree analysis conducted at the first parent node (node 0). A total of 6 child nodes (nodes 1 to 6) were obtained in this analysis. Four of these (nodes 3 to 6)

Table 4. Results-1.

1) Patient profile	1-a). Sex	Male	34.0%
		Female	66.0%
	1-b). Age	Av. 81.0 yrs (S.D.7.1)	
	1-c). Medical institution visited	Clinic or physician's office	55.4%
		Private hospital	21.5%
		Public hospital	18.0%
		University hospital	5.1%
		Tab 3 mg	3.1%
		Tab 5 mg	24.2%
		Tab 10 mg	0.2%
	2-a). Donepezil strength & 2-b). Dosage form	OD tab 3 mg	9.0%
		OD tab 5 mg	54.9%
		OD tab 10 mg	8.4%
		Fine granule	0.2%
		Before Breakfast	0.9%
2) Regimen prescribed		After Breakfast	88.9%
		After Lunch	0.6%
	2-c). Dosage	After Dinner	7.9%
		Before Bed	0.9%
		Other	0.9%
	2-d). Supply dispensed per prescription	Av. 33.5 days (S.D., 20.5)	
		Alone in a blister package	56.3%
	2-e). How dispensed	One-dose packages with other drugs	39.1%
		One-dose packages with donepezil alone (without other drugs)	4.7%
	2-f). Concomitant drugs	Av. 3.1 medicines (S.D., 2.9)	
		Patient himself/herself sees physician	77.5%
3) Physician consultation status		Someone besides the patient sees the physician	10.0%
		Unknown	12.5%
		Take all as instructed (4)	81.2%
4) Donepezil adherence		Forget once or twice a week (3)	10.2%
		Only take once or twice a week (2)	0.9%
		Never take (1)	0.2%
		Information unavailable (0)	7.5%
		A family member other than spouse such as a daughter	38.6%
5) "Key person" who has the central role in overseeing the donepezil adherence		Spouse	22.6%
		Patient	22.3%
		Professional caretaker	16.5%

Table 5. Results-2.

		Understands well (4)	31.30%
		Mostly understands (3)	40.30%
	6-a). Understanding of donepezil administration and dosage	Does not understand very well (2)	7.50%
		Does not understand at all (1)	1.50%
		Unknown (0)	19.40%
		Understands well (4)	22.30%
		Mostly understands (3)	46.80%
6) Key person's understanding of donepezil	6-b). Understanding of effect	Does not understand very well (2)	9.20%
		Does not understand at all (1)	1.50%
		Unknown (0)	20.30%
		Understands well (4)	13.40%
		Mostly understands (3)	39.50%
	6-c). Understanding of general side effect	Does not understand very well (2)	17.70%
		Does not understand at all (1)	2.90%
		Unknown (0)	26.50%
		Understands well (4)	16.3%
		Mostly understands (3)	42.8%
	7-a). Understanding of the characteristic symptoms of cognitive impairment	Does not understand very well (2)	13.2%
		Does not understand at all (1)	1.5%
		Unknown (0)	26.3%
7) Key person's understanding of cognitive impairment		Understands well (4)	19.2%
		Mostly understands (3)	37.2%
	7-b). Understanding of the treating Physician's treatment plan	Does not understand very well (2)	12.7%
		Does not understand at all (1)	1.3%
		Unknown (0)	29.6%
		Well aware (4)	26.5%
		Mostly aware (3)	37.8%
8) Key person's awareness of own cognitive impairment		Not very aware (2)	10.2%
		Completely unaware (1)	1.7%
		Unknown (0)	23.8%
		Has a thorough awareness (4)	7.1%
		Has a general awareness (3)	20.7%
9) Key person's awareness of therapeutic effect		Does not have a very good awareness (2)	26.5%
		Has no awareness (1)	2.9%
		Unknown (0)	42.8%
		Positive (4)	15.4%
		Somewhat positive (3)	39.5%
10) Key person's attitude toward treatment (positive/negative)		Somewhat negative (2)	7.9%
		Negative (1)	1.3%
		Unknown (0)	35.9%

Table 6. Factors related to adherence.

Items (n)		Adherence (%)		P
		Good	Poor	
Key person (407)	Patient	87.5	12.5	0.004
	Spouse	92.3	7.7	
	Family member other than spouse	81.4	18.6	
	Professional caretaker	97.0	3.0	
Understanding of usage and dosage about Donepezil (365)	Understands	88.7	11.3	<0.001
	Does not understand	65.8	34.2	
Understanding of Donepezil's effects (363)	Understands	88.6	11.4	0.002
	Does not understand	72.3	27.7	
Understanding of Donepezil's side effects (334)	Understands	91.3	8.7	<0.001
	Does not understand	72.3	27.7	
Understanding of characteristic symptoms of cognitive impairment (339)	Understands	89.8	10.2	<0.001
	Does not understand	70.8	29.2	
Understanding of physician's therapeutic plan (322)	Understands	90.4	9.6	<0.001
	Does not understand	67.7	32.3	
Awareness of own cognitive impairment (349)	Aware	89.2	10.8	0.001
	Not aware	71.7	28.3	
Awareness of therapeutic effect (270)	Has awareness	92.4	7.6	0.001
	Does not have awareness	77.5	22.5	
Attitude toward cognitive impairment treatment (296)	Positive	89.1	10.9	<0.001
	Negative	67.5	32.5	

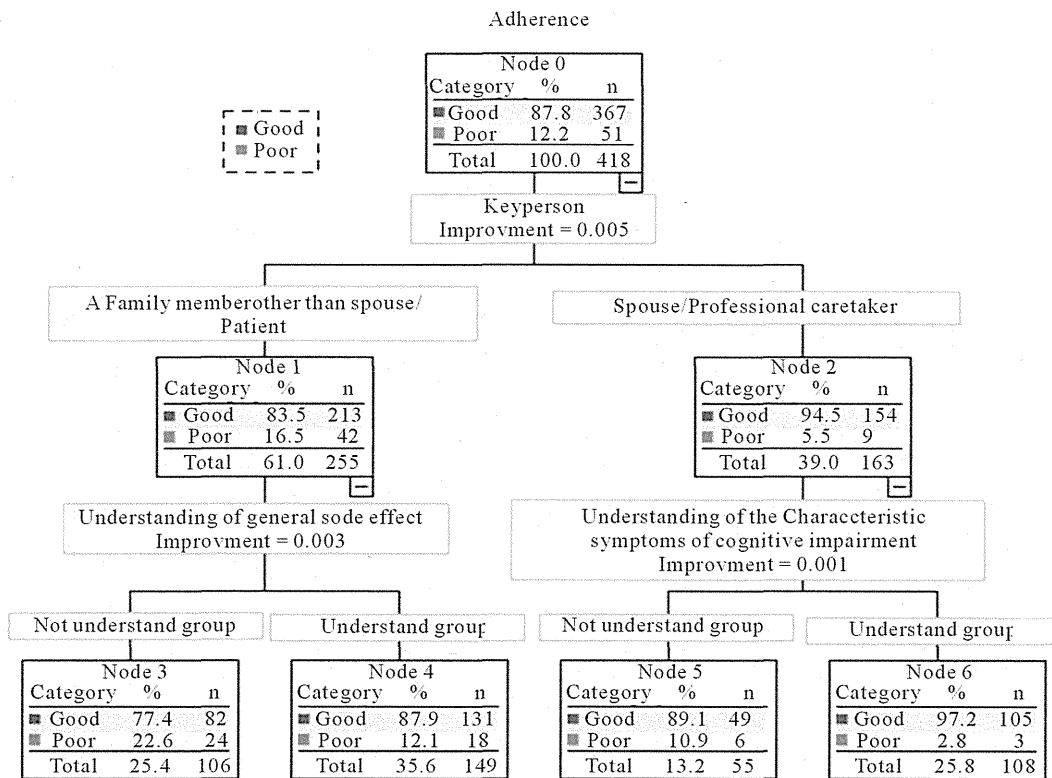


Figure 3. The result of decision tree analysis.

were terminal nodes (where splitting stopped). The deepest splitting in the decision tree model was to the 2nd level.

“Key person” was selected as the factor that would be split at node 0. On the process of the decision tree modeling, the key person was split on the group having “the patient” or “a family member other than the spouse” as the key person (node 1) and the group having “the spouse” or “a professional caretaker” as the key person (node 2), and there was a higher percentage of “good” adherence in node 2 than node 1. Nodes 1 and 2 were also split at the next level. “The key person’s understanding of donepezil’s side effects” was selected as the factor on which node 1 would be split. There was a higher rate of “good” adherence in the group that gave the response of “4. Understands well” and “3. Mostly understands” (node 4) for “key person’s understanding of donepezil’s side effects” than in the group that responded “2. Does not understand very well” to “0. Unknown” (node 3). Node 2 was split on the factor “the key person’s understanding of the characteristic symptoms of cognitive impairment”. There was a higher rate of “good” adherence in the group that gave the response of “4. Understands well” or “3. Mostly understands” (node 6) for “the key person’s understanding of the characteristic symptoms of cognitive impairment” than in the group that responded “2. Does not understand very well” or “0. Unknown” (node 5).

Decision trees are generally “pruned” to limit the number of levels so that the results will not be overly complex. However, since the analysis stopped after generating only 2 levels, we did not do any pruning and used the results here as is.

4. Discussion

In our study, 81.2% of the patient data showed “take all as instructed”. The results indicated that general adherence to donepezil treatment regimens was good in outpatients with cognitive impairment. This trend is consistent with previous studies [18,19]. The χ^2 test results also suggested that all types of key persons contributed to adherence, that not only a professional caretaker but also a family member involved contributed to the adherence to donepezil, and that it was possible that adherence could improve with education by pharmacist to the key person.

Our result suggested that the relationship of the key person with adherence is such that adherence is comparatively low when the key person is the patient himself/herself or a family member other than the spouse, and that adherence is good when the key person is “a professional caretaker”. This may be because it is highly likely that a patient with a professional caretaker as the

key person lives in a care facility and adherence is maintained because the facility staff manages the patient’s medication.

This issue is correspondent with the issue written by Kemuyama, which said care workers in care facilities of cognitively impaired patients are required to stay compliant by recognizing the symptoms [31].

Furthermore, our results implied that maintaining adherence has a linkage with improving knowledge about the medication (knowledge of donepezil administration and dosage, effects, and general side effects) and with improving the key person’s understanding of the symptoms of cognitive impairment and the physician’s treatment plan. The relationship with adherence of the key person’s awareness of his own cognitive impairment may be such that if the key person is aware that he has cognitive impairment, the significance of the drug treatment regimen will become clear and adherence will be maintained. It was also confirmed that the key person’s awareness of the effectiveness of the therapy and attitude toward the treatment (positive/negative) are related to maintaining adherence. Donepezil does not promise to improve symptoms markedly; rather, the objective of the therapy is to “maintain the status quo” by slowing down the progression of symptoms. Given the nature of donepezil therapy for cognitive impairment, the present results suggested that the ability to increase the key person’s understanding of the significance of taking donepezil or his or her awareness of its effectiveness holds the key to improved attitude toward the treatment (positive/negative) and, in turn, maintaining adherence.

The results of the decision tree modeling showed that the key person has the strongest relationship with adherence. On the process of the decision tree analysis, key person was split on the group having “the patient” or “a family member other than the spouse” as the key person (node 1) and the group having “the spouse” or “a professional care taker” as the key person (node 2). Node 1 was then split on “the key person’s understanding of donepezil’s side effects,” and node 2 was split on “the key person’s understanding of the characteristic symptoms of cognitive impairment.” This suggests that the first step in maintaining and improving adherence is to know who the “key person” is.

The extent of the key person’s involvement in care giving may be the reason why the factors related to adherence differed according to who the key person is. Since “the spouse” or “a professional caretaker” at node 2 is frequently in a position to directly support the patient’s activities of daily life, there was a tendency for adherence to be higher when the key person’s understanding of the patient’s symptoms was good. Conversely, with “a family member other than the spouse or patient” at node 1, adherence tended to be higher when

there was a good understanding of side effects because 1) there is a tendency to deny the presence of cognitive impairment and 2) a good understanding of the side effects eliminates resistance to and anxiety about taking the medication.

Jane R. *et al.* said it is important that a pharmacist educates the care-giver of the cognitively impaired patient [32], and this research suggested the possibility that “education to have you understand the symptoms of cognitive impairment” was effective.

The results also suggested that “to educate about symptom of cognitive impairment” is more effective for persons who are directly involved in the care such as the spouse or caretakers.

In addition, Sen-Roy states that a pharmacist should tell the patient and his or her family that the drug used in the treatment of cognitive impairment is for the purpose of maintaining the status quo [29], but our study suggested that it is important that the pharmacist informs about the “side effects and cognitive impairment symptoms”. Furthermore, it was suggested that points of reporting were different by key person.

A study about classification of care-givers of cognitive impairment patients, report on a male spouse [34] and an unpleasant female spouse [35], but our study suggests the possibility that education for a family except the spouse influenced adherence to medication.

Jane R. mentions the education that pharmacist provides to the care-giver should be done based on the observation of the behavioral disorder of the cognitive impairment patients living in the local area, because pharmacists are able to contact them on a regular basis [28].

We believe that we were able to clearly state “what kind of education is effective for what kind of care-giver” by this study.

Mort and Tasler wrote that pharmacists must educate caregivers of cognitive impairment patients [28], and our present study also suggested that educating caregivers on the symptoms of cognitive impairment is potentially effective. Sen-Roy wrote that the patient and his or her family should be told that medications for cognitive impairment simply maintain the status quo [29]. However, our results confirmed that it is important to provide information about the side effects of cognitive impairment medications and the symptoms of the disease, as well as the “effects” of the medication. In addition, our results suggested that the information to be provided to key persons differs according to who the key person is.

In the present study, we performed a statistical analysis of data based on the information that pharmacists record in the patients’ profiling system called “YAKUREKI”, but there were many responses of “Unknown” for certain items on the survey, reflecting the fact that a sufficient amount of information is not being obtained

and/or the pharmacist may have transcribing errors. This is because it is difficult for the pharmacist to directly confirm the patient’s condition and the pharmacist can only hear indirectly from caregivers, family members, and the like, since there are many cases in which the person who visits the pharmacy is not the patient himself/herself, given the nature of cognitive impairment. Consequently, pharmacists must make a greater effort to collect information from the people who go to pharmacies to receive medicines and from other healthcare professionals, and to record more information in the profiling system.

5. Limitations of the Study

The objective of the present study was to identify factors related to treatment adherence in outpatients with cognitive impairment by examining the regimens prescribed and treatment adherence at community pharmacies in Japan. However, we became aware of 2 limitations to the study due to its special circumstances.

The first limitation is that it is difficult to identify patients with cognitive impairment because pharmacists at Japanese community pharmacies cannot view the medical records kept by physicians and diagnoses are not written on prescriptions. We therefore considered patients prescribed donepezil to be “patients with cognitive impairment” because the acetylcholinesterase inhibitor was the only drug approved for cognitive impairment in Japan at the time of the survey. As a result, one cannot rule out the possibility that patients with cognitive impairment not taking donepezil were excluded from the study.

The second limitation concerns the method of assessing adherence. The authors developed their own measures of adherence since a standardized assessment tool does not exist in Japan. In the present study, we did not question patients directly about adherence, but rather selected a protocol under which pharmacists performed an objective assessment using data in the profiling system. Therefore, we concluded that an evaluation using pill counts and multiple choices would not be valid as an adherence assessment scale for the present study, and we adopted an assessment scale in which “information unavailable” was added to a 4-grade scale for frequency of forgetting to take medication per week. The pharmacists who participated in the pilot study said that this assessment scale afforded easy communication with the key person, enabling them to make an assessment reflecting the actual situation. It was therefore concluded that the present assessment method would not present major problems in the interpretation of the results.

6. Conclusion

It was confirmed that the key person’s understanding of