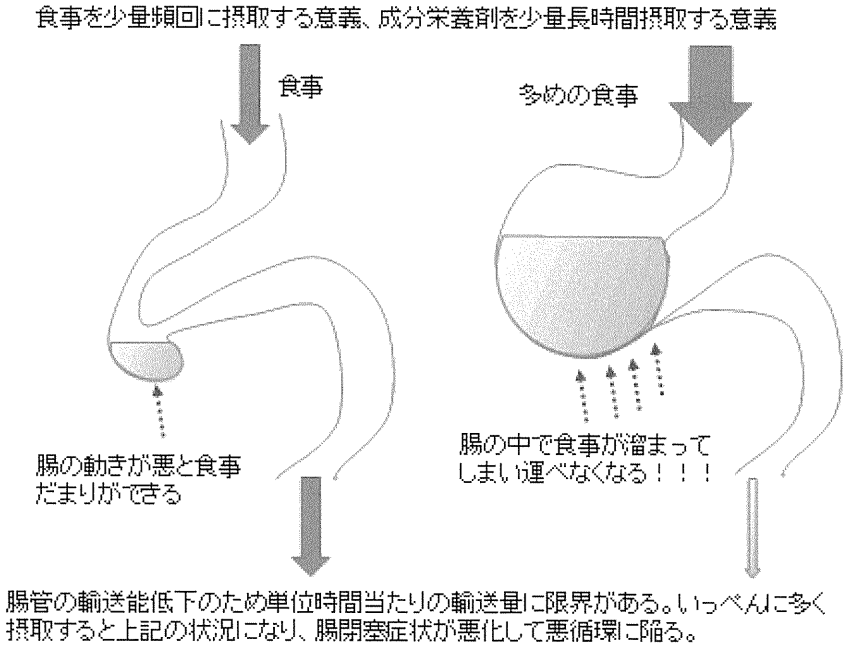
悪化するようならきわめて少なく、小分けにして、場合によってはエレンタールなどの成分栄養をできるだけ早く使用したほうがよいかもしれません。さらに症状が悪化するなら早めに在宅 IVH などを行うほうが QOL はよろしいかと思います。

Q13. 先生は食事やエレンタールはできるだけ小分けにしてとるようにと言いますがどうしてですか？

A13. CIPO は食事を腸の中で運ぶ速度がゆっくりになる病気で、運べる速度、量以上に食事や成分栄養剤をとると腸の中に以下のようなたまりができて食事が詰まってしまい腸閉塞症状が悪化します。従ってできるだけ少量を、特にカスになりにくい食事をとることが肝心です。成分栄養としてエレンタールなどを内服している場合も同じでできるだけ少量小分けにして長時間かけて服用することです。



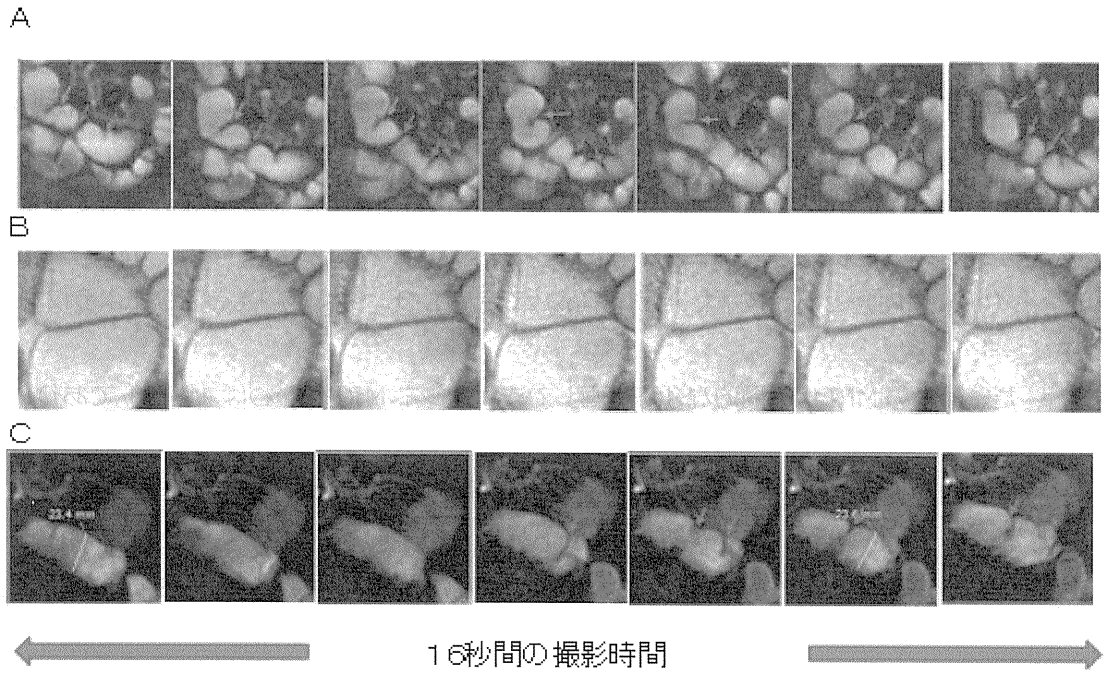
Q14. 大腸型の慢性偽性腸閉塞という病気があるのでしょうか？

A14. 大腸型限局型の偽性腸閉塞という病気が知られております。この病気の診断は専門医でないと難しいのですが、もし大腸限局型でしたら、CIPO のように小腸の異常がなく、吐き気などの腸閉塞症状も軽いことが多いようです。また、手術で結腸を切除することで、症状が取れ、経過が良いことがわかっております。

シネ MRI とは？

MRI とは Magnetic Resonance Imaging（核磁気共鳴画像法）の略で、磁気を利用して生体の断層写真を撮ることができるものです。同様に生体の断層写真を撮ることができる CT

は若干の放射線被曝を伴いますが、MRI は被曝を伴わないというメリットがあります。また任意の断層像を得られるという特長があります。これまで CT や MRI は臨床の現場で数多く利用され、医学の進歩に大きく貢献してきました。近年この MRI の分野でシネ MRI（cine-MRI）という技術が非常に進歩してきており、多くの脚光を浴びるようになりました。通常の MRI は瞬間的な「静止画」ですが、シネ MRI はいわば「動画」であり、一定時間の内臓の動きを映画（シネマ）のように動画としてとらえることができます。このシネ MRI を腸管に応用することで、特に小腸の蠕動運動（内容物を先に送ろうとする腸の動き）や胃の運動、腸管の拡張程度、癒着、腸管内容物などが非常に詳細に分かるようになってきました。ただしシネ MRI を用いた診断基準は現在のところ明確なものがまだなく、今後は偽性腸閉塞（CIPO）において、本邦で広く利用できる MRI 検査を用いたより正確な診断の普及が望ましいと考えます。シネ MRI は前処置不要で数分で検査を終えることができ、また被曝もないため非常に低侵襲な検査法であります。また保険診療が可能です。我々が行っている方法は造影剤を使用せず 16 秒の息止めを患者様にしていただき、その間の腸管の運動を観察するものです。



A：健常な人のシネMRI像
B：CIPO患者のシネMRI像（拡張があるタイプ）
C：CIPO患者のシネMRI像（拡張のないタイプ）

通常大腸は 20 分に 1 回程度の蠕動だけですが、一方小腸は 10-20 秒毎に蠕動して内容物を絶えず輸送しています。A は健常人の小腸の一部で小腸の拡張を認めず、さらに 16 秒間の撮影期間中に活発な腸管の収縮拡張運動を認めます。一方 B は CIPO の患者様の画像ですが、16 秒の間に腸管の運動は全くなく、また内容物が停滞するため A と比べて腸管径も著明に拡張しています。なお C もやはり CIPO 患者様の小腸ですが、拡張ははっきりとは認めないものの運動は正常例を比較すると非常に緩慢なのが分かります。シネ MRI は簡便なうえにほぼ全小腸の運動を観察でき、腸ろうの造設の際や、治療前後での比較など今後活用が期待されます。

ただし通常の MRI と同様、①心臓ペースメーカーが埋め込まれている方、②脳動脈瘤クリップ術後の方、③その他手術などで金属が体内に埋め込まれている方は撮影することができませんので注意が必要です。ご不明な点がありましたらお気軽にご相談ください。

Q1. 私は以前から腹部膨満、腹痛などに悩まされ、先日偽性腸閉塞と診断されました。診断がついた後もシネ MRI を撮る必要性はありますか？

A1. 偽性腸閉塞は手術後 6 か月以内に起こる急性型と、手術の既往なく 6 か月以上症状が続く慢性型に大きく分けられます。特に慢性偽性腸閉塞（CIPO）は、現段階の診断基準では 6 か月以上続く腸閉塞症状（そのうち 12 週は腹痛・腹部膨満感を伴う）に加え、CT やレントゲン写真で特徴的な所見を認めるものと定義されています。このため CT やレントゲン、自覚症状だけで診断自体はつくのですが、これだけではどの腸管の動きが悪いのかなどが分かりません。シネ MRI を追加することで、ほぼ全小腸の動きが把握でき、どこの腸管が、どのくらいの範囲にわたって、どの程度動きが悪いのか、などが一目瞭然となります。シネ MRI は適切な治療方針を決める上でも、また治療前後の腸管蠕動の変化を評価する上でも非常に有用な検査といえます。

Q2. どのようにしてシネ MRI をとるのですか？

A2. 検査に際して特に食事を止めたり下剤を飲んだりする必要はありません。小腸に内容物がある方が評価しやすいので、検査直前に可能な範囲で水を飲んでいただきます。

Q3. 他に偽性腸閉塞を診断する手段はありますか？

A3. A1 でも述べたように、現時点での厚労省の診断基準では自覚症状・レントゲン・CT だけで診断ができるようになっていますが、レントゲン・CT だけでは腸管拡張などの異常がはっきりせず、実際は偽性腸閉塞であるにもかかわらず診断が下せない場合もあります。このような方にシネ MRI を撮ると蠕動低下が判明し、偽性腸閉塞という正確な診断が下せるようになることもしばしばあります。ほかに、マノメトリーや胃シンチグラフィーなどが欧米では行われておりますが、これらはシネ MRI よりも侵襲的であり、そもそも日本ではほとんど普及しておりません。

Q4. 心臓ペースメーカーや脳動脈クリップ以外で MRI が施行できないのはどのような場合ですか？

A4. 近年、整形外科などの手術で埋め込まれる金属の大半が MRI を行っても大丈夫な素材となっておりますが、かなり以前の手術や材質が確認できない場合は MRI は施行できません。また狭心症や心筋梗塞で心臓カテーテルを行った方で、冠動脈ステント挿入直後の方などは一般的に MRI ができません。些細な点でもご不明な点はまず担当医にご相談ください。

Q5. シネ MRI は保険診療の適応となりますか？

A5. 通常の保険診療が可能です。

平成23年度厚生労働科学研究費補助金難治性疾患克服研究事業
慢性特発性偽性腸閉塞症の我が国における疫学・診断・治療の実態調査研究
分担研究報告書

8．当該疾患の診断基準案の発信と国際批判に耐えうる改訂

分担研究者　中島淳（横浜市立大学医学部消化器内科　教授）
研究協力者　大久保秀則　（横浜市立大学医学部消化器内科）

研究要旨：平成21年度に当研究調査班で作成した本邦発の慢性特発性偽性腸閉塞の診断基準（案）に関して、平成22年度には当疾患の経験豊富な欧米の専門家から意見・批判をいただき、改訂診断基準案を作成した。本年度は、平成21年度診断基準案の妥当性の評価に関する論文を作成したが、この際にいただいた海外専門家からの有意義な批判をさらに組み込み、より国際性の高いものにするべく平成23年度版の改訂診断基準案を作成した。

I. 研究目的

平成22年度の改訂診断基準案に、さらに海外専門家の建設的意見・批判を取りいれ、より実用的かつ国際批判に耐えうる診断基準に改訂すること。

J. 研究方法

本年度は、平成21年度に初めて作成した慢性特発性偽性腸閉塞症の診断基準（案）の我が国への有用性を検討し論文を作成した。この際に受けた海外専門家の建設的意見を基に、平成22年度の改訂診断基準案からさらに改訂を加えた。

K. 研究結果

慢性特発性偽性腸閉塞症の診断の要点は①6ヶ月以上前から腸閉塞症状があり、そのうち12週は腹部膨満を伴うこと、②画像所見で腸管拡張または鏡面像を認めること、③器質的狭窄・閉塞が除外されること、の3つをすべて満たすことである。

＜今回受けた海外専門家による意見とその対応＞

a) これまでの診断基準案では、これらの3点が必須事項であることが明記されておらずに分かりにくいとの指摘を受けた。この点を受け、診断基準の表記を一部変更し、下記の１）～３）をすべてみたすもの、と明記した。

b) マノメトリーやシンチグラフィー、消化管全層生検などの本疾患特異的な検査は、我が国をはじめ、（発展途上国を含め）多くの国が臨床現場では使えないものと思われる。したがってこれらの検査を必須項目としない本診断基準は今後の海外で広く受け入れられるものである、との高い評価をいただいた。
これらの検査は過去の欧米の診断アルゴリズムに含まれているが、必須項目としてではなく、あくまでも診断をより確定的するための手段としての位置づけである。従って、これらの検査を必須事項に加えることは診断基準が実用的でなくなるため不適切と考え、本年度もこれらの検査を必要としない診断基準とすることを重視した。

c) 診断基準２）に書かれている「画像所見での腸管拡張」とは小腸もしくは大腸いずれを指すのか？という指摘を受けた。この点に関しては基本的には主な罹患部位である「小腸」

をさすが、大腸限局型などの特殊なケースも存在するため、あえて両者を区別するような表現は避け、従来通り「腸管拡張」との表現を用いることとした。また、その方が一般内科医に対しても平易に用いられる診断基準であると考える。

＜今回の変更点のまとめ＞

a) 診断基準の表記を一部変更し、下記の１）～３）をすべてみたすもの、と明記した。

b) シネ MRI で腸管蠕動低下を認めた場合、診断はより確定的となる、との表現を付記所見・参考所見に加えた。

平成 23 年度慢性偽性腸閉塞の改訂診断基準案

疾患概念

消化管に器質的な狭窄・閉塞病変を認めないにもかかわらず腸管蠕動障害（腸管内容物の移送障害）を認めるもので、慢性の経過をみるもの。

診断基準

下記の１）～３）すべてを満たすもの。

１）６ヶ月以上前から腸閉塞症状があり、そのうち 12 週は腹部膨満を伴う。

２）腹部単純 X 線検査、超音波検査、CT で腸管拡張または鏡面像を認める。

３）消化管 X 線造影検査、内視鏡検査、CT で器質的狭窄・閉塞が除外される。

付記所見・参考所見

１．慢性の経過（6 ヶ月以上）で 15 歳以上の発症とする。＊先天性・小児は別途定める。

２．薬剤性・腹部術後によるものは除く。

３．原発性と続発性に分け、原発性は病理学的に筋性、神経性、カハール介在細胞性、混合型に分けられる。続発性は全身性硬化症、パーキンソン病、ミトコンドリア異常症、2 型糖尿病などによるものがある。

４．家族歴があることがある。

５．腸閉塞症状とは、腸管内容の通過障害に伴う腹痛・腹部膨満。悪心嘔吐、排便排ガスの減少を指す。食欲不振や体重減少、Bacterial overgrowth による下痢・消化吸収障害を認めることがある。

６．障害部位は小腸や大腸のみならず食道から直腸に至る全消化管に起こることが知られており、同一患者で複数の障害部位を認めたり、障害部位の増大を認めることもある。また神経障害（排尿障害など）、及び精神疾患を伴うことがある。

７．シネ MRI で腸管蠕動低下を認めた場合、診断はより確定的となる。

L. 考察

我が国を含め、これまで慢性特発性偽性腸閉塞症の明確な診断基準を提唱することは本研究が初めてである。海外において、過去に 2 つの診断アルゴリズムが提唱されているが、「診断基準」とは異なり、あくまでも診断までのフローチャートを示すものである。したがって我々の提唱する診断基準は当該疾患では世界初の試みである。

過去の診断アルゴリズムは、系統的な鑑別診断が可能であるという長所がある反面、一般内科医には使用しにくいという短所がある。症状発症から正確な診断まで平均 7 年以上を要する本疾患を、より早く診断し適切な治療に結びつけるためには、より平易で一般内科医に対しても簡単に使用可能なものでなくてはならない。我々が提唱する診断基準案はこの点を重要視しており、日常臨床でも非常に実用的なものであると考える。海外専門家の意見も考慮しさらに改訂した診断基準は、我が国のみならず、国際的にも十分使用可能なものであると思われる。

M. 結論

平成 22 年度の改訂診断基準案に、さらに海外専

門家の建設的意見・批判を取りいれ、より実用的かつ国際批判に耐えうる診断基準に改訂した。

N. 健康危惧情報

なし

O. 研究発表

９． 論文発表

Hidenori Ohkubo, Hiroshi Iida, Hirokazu Takahashi, Eiji Yamada1, Eiji Sakai, Takuma Higurashi, Yusuke Sekino, Hiroki Endo, Yasunari Sakamoto,Masahiko Inamori, Hajime Sato, Kazuma Fujimoto, Atsushi Nakajima :
An epidemiologic survey of chronic intestinal pseudo-obstruction (CIPO) and evaluation of the newly proposed diagnostic criteria.
Digestion 2012; In press

１０． 学会発表

なし

P. 知的財産権の出願・登録状況

１３． 特許取得

なし

１４． 実用新案登録

なし

１５． その他

なし

An epidemiologic survey of chronic intestinal pseudo-obstruction (CIPO) and evaluation of the newly proposed diagnostic criteria

Hidenori Ohkubo[1], Hiroshi Iida[1], Hirokazu Takahashi[1], Eiji Yamada[1], Eiji Sakai[1], Takuma Higurashi[1], Yusuke Sekino[1], Hiroki Endo[1], Yasunari Sakamoto[1], Masahiko Inamori[1], Hajime Sato[2], Kazuma Fujimoto[3], Atsushi Nakajima[1*]

[1]Gastroenterology Division, Yokohama City University School of Medicine, Yokohama, Japan
[2]Department of Health Policy and Technology Assessment National Institute of Public Health, Wako, Japan
[3]Gastroenterology Division, Saga University School of Medicine, Saga, Japan

[*]Corresponding Author: Atsushi Nakajima. M.D., Ph.D.
Gastroenterology Division, Yokohama City University School of Medicine
3-9 Fuku-ura, Kanazawa-ku, Yokohama, 236-0004 Japan
Tel; +81-45-787-2640, Fax; +81-45-784-3546
E-mail; nakajima-tky@umin.ac.jp

Short title:

A nationwide epidemiologic survey of CIPO

Abbreviations

IPO: Intestinal pseudo-obstruction
CIPO: Chronic intestinal pseudo-obstruction
SSc: Systemic sclerosis
CIIP: Chronic idiopathic intestinal pseudo-obstruction
CSIPO: Chronic small intestinal pseudo-obstruction
CCPO: Chronic colonic pseudo-obstruction
ICC: Interstitial cells of Cajal
JSGE: Japanese Society of Gastroenterology
DM: Dermatomyositis
MCTD: Mixed connective tissue disease
SjS: Sjögren syndrome
PPI: Proton pump inhibitor
H2RA: H2 receptor antagonist

Keywords
chronic intestinal pseudo-obstruction, diagnostic criteria, algorithm

Abstract

Background and Aims: Chronic intestinal pseudo-obstruction (CIPO) is an intractable disease in which clinical symptoms of intestinal obstruction appear without mechanical cause. No clear diagnostic criteria have been established; therefore, we proposed diagnostic criteria to facilitate the diagnosis of this rare disease. The purpose of this study was to evaluate the usefulness and validity of our diagnostic criteria.

Materials and Methods: A questionnaire was sent to 378 institutions belonging to the Japanese Society of Gastroenterology (JSGE) during the period between December 2009 and February 2010. We summarized the returned data and performed statistical analysis of the data.

Results: A total of 160 cases were included, and 141 cases (88.1%) fulfilled the criterion of disease duration of more than 6 months, and 157 cases (98.1%) fulfilled the criterion of the clinical symptoms of abdominal pain and/or bloating. Furthermore, 154 cases (96.2%) fulfilled the criterion of the imaging findings. Eventually, 138 cases (86.3%) fulfilled all the criteria.

Conclusion: The proposed diagnostic criteria were useful with a high sensitivity of 86.3% for Japanese patients. Improved recognition of CIPO and practical use of the criteria are desired. The criteria should be appropriately modified by many researchers to make them more practical and internationally applicable.

Introduction

Intestinal pseudo-obstruction (IPO), first reported by *Dudley et al.* in 1958, is a rare, serious digestive syndrome characterized by failure of the intestinal tract to propel its contents appropriately, resulting in recurrent clinical episodes of intestinal obstruction in the absence of any mechanical cause [1-5]. Acute or chronic abdominal pain and distension are the most common symptoms of this disease. Furthermore, nausea, vomiting, constipation and diarrhea are also seen at various frequencies. Based on the pattern of onset, IPO is classified as the acute or the chronic type. The acute type, especially acute pseudo-obstruction of the colorectum, is referred to as Ogilvie Syndrome, which encompasses several colonic obstructive syndromes caused by acute functional transit failure. It is speculated that this syndrome is caused by a collapse of regulation of the autonomic nerves distributed in the colorectum. Ogilvie Syndrome is secondary to various diseases, and has been mainly reported to occur after abdominal surgery [6].

On the other hand, the chronic type is the so-called CIPO. Although there are no specific laboratory findings, malabsorption due to bacterial overgrowth, anemia, hypocalcemia, hypolipidemia, folic acid deficiency, iron deficiency and hypoalbuminemia are often observed due to malnutrition in CIPO patients [2-4]. CIPO may affect the entire gut from the esophagus

to the rectum in the broad sense, but predominantly the small intestine is affected. CIPO can be categorized as primary or secondary [7]. Primary CIPO includes the myogenic type, neurogenic type, mesenchymopathic type (arising from dysfunction of the interstitial cells of Cajal; ICC), and the mixed or unclassifiable type (inflammation). Secondary CIPO includes a subtype that is secondary to underlying diseases such as SSc or mitochondrial encephalomyopathy, and a subtype that is related to antipsychotic or antidepressant drug use. The subtype of CIPO that is not associated with any apparent underlying disease has been called chronic idiopathic intestinal pseudo-obstruction (CIIP).

At present, the diagnostic criteria for CIPO have not yet been well established around the world. The Research Group for the Survey of the Actual Conditions of Epidemiology, Diagnosis, and Treatment of CIIP in Japan (Chief investigator, Atsushi Nakajima), Research Project for Overcoming Intractable Disease, Health Labour Sciences Research Grant in the fiscal year 2009, proposed the Japanese diagnostic criteria of CIPO in order to facilitate the diagnosis of this rare disease by the general physician. The criteria are composed of four mandatory requirements and an important note for the diagnosis, as shown in Table 1. Recently, Iida et al. investigated the reported data of a total of 121 Japanese cases of CIPO during the period between 1983 and 2009, and calculated the sensitivity of the proposed diagnostic criteria [8], under the assumption that these case reports contained sufficient information about each patient; therefore all cases were considered to be correctly diagnosed as having CIPO. However, very little is still known about the pathophysiology of CIPO and the status of CIPO patients in Japan; therefore, we conducted an epidemiologic survey to assess the present status of this rare disease in the Japanese population following their investigation of previous case reports. We investigated the recognition rate of the disease in certified gastroenterology institutions, and also its epidemiology, including the clinical symptoms and radiological imaging findings in the patient; then, we evaluated the validity and usefulness of the diagnostic criteria for CIPO newly proposed by this research group.

Materials and methods

A questionnaire was sent to 378 institutions belonging to the Japanese Society of Gastroenterology (JSGE) during the period between December 2009 and February 2010. At first, we enquired whether or not each of the participating institutions was aware of CIPO as a disease entity or had encountered patients with CIPO. While enquiring about the institutions' recognition of this disease, CIPO was defined as a disease characterized by recurrent clinical episodes of intestinal obstruction in the absence of mechanical obstruction, as confirmed by clinical examinations, including radiological imaging and gastrointestinal endoscopy. Then, the institutions that had knowledge about this disease entity were asked to fill out the questionnaire,

based on the premise that the gastrointestinal specialists in the institutions had certainly performed the aforementioned examinations to exclude mechanical obstruction and made a correct diagnosis for CIPO. The details of the questionnaire are shown in Table 2. Here, the term 'Dilatation of the bowels on Radiological Imagings' indicates not only dilatation of the small intestine, but also that of the colon. We decided to use the simplistic term, 'the bowels' because of the following two reasons; 1) our intention in establishing diagnostic criteria is to facilitate the diagnosis of CIPO by the general physician without any need for complicated or specialized discussions, such as 'which is the dilated bowel, small intestine or colon?'; 2) 'colon' should not be excluded, because special cases such as colorectal localized-type (chronic colonic pseudo-obstruction: CCPO) sometimes exist.

The closing date for receipt of the questionnaire responses was 19 February, 2010. Then, we aggregated the data on the type of CIPO (primary or secondary), age at the time of the first hospital visit, clinical symptoms, radiological imaging findings, duration of disease, and method of treatment in each patient, and conducted a statistical analysis of the data.

Results

1) Recognition of CIPO and experience with CIPO at each institution

In all, 216 (57.2%) of the 378 institutions responded to our questionnaire, and of these, 200 (92.6%) were aware of CIPO as a distinct disease entity, and 103 (51.5% of those that were aware of CIPO as a distinct disease entity) had encountered cases of CIPO. None of the institutions that were unaware of CIPO as a distinct disease entity answered "have encountered the CIPO cases". The number of cases was zero in 97 (48.5%), one in 52 (26.0%), two in 17 (8.5%), three in 7 (3.5%), four in 1 (0.5%), five in 2 (1.0%), six in 3 (1.5%), seven in 2 (1.0%), eight in 1 (0.5%), ten in 2 (1.0%), twenty-seven in 1 (0.5%) of the institutions. A total of 213 patients were accumulated from 103 institutions until 19 February, 2010. Of the 213 patients, 53 for whom detailed information (e.g. sex, clinical symptoms) was not available from the questionnaire, were excluded from this analysis. Eventually, the data of a total of 160 patients were included in this study.

2) Type of CIPO

Analysis of the data of the 160 cases revealed that 77 (48.1%) were male and 83 (51.9%) were female, the type of CIPO was primary in 117 cases (73.1%), secondary in 41 cases (25.6%), and unknown in 2 cases (1.3%), as shown in Table 3. The underlying cause in the cases with secondary CIPO was SSc in 23 cases (56.1%) and non-SSc in 18 cases (43.9%). Collagen diseases were prominent among the non-SSc cases, and included dermatomyositis (DM) in 4 cases (9.8%), mixed connective tissue disease (MCTD) in 3 cases (7.3%), and Sjögren syndrome (SjS) in 1 case (2.4%). The other causes of non-SSc CIPO were amyloidosis in 2

cases (4.9%) and 'others' in 8 cases (19.5%).

3) Age at the time of the first hospital visit

The majority of the patients of both sexes were in their 60's at the time of the first hospital visit (male: 25.7%, female: 24.1%).

4) Clinical symptoms

Our evaluation of the clinical symptoms in the 160 cases showed that abdominal bloating was the most common symptom, being recorded in 156 cases (97.5%), and that abdominal pain and vomiting were relatively common symptoms, being recorded in 107 cases (66.9 %) and 81 cases (50.6%), respectively (Table 4). In all, 157 cases (98.1%) had at least one of these two symptoms (abdominal bloating / abdominal pain), which fulfilled the diagnostic criterion 2.

5) Radiological imaging findings

In this survey, we defined positive imaging findings as the presence of dilatation and/or air-fluid levels of the bowels. Figure 1 is a typical abdominal radiograph of a CIPO patient showing marked distention of the small intestine with a large amount of intestinal gas. Figure 2 shows a typical CT image of a CIPO case. The number of patients among the 160 patients with positive imaging findings was 154 (96.2%), and that without positive findings was 3 (1.9%); the status with regard to this finding was unknown in 3 cases (1.9%) (Table 5). Thus, 154 of the 160 cases (96.2%) showed dilatation of the bowel loops and/or air-fluid levels of the intestine on plain radiographs or CT images of the abdomen, which is included as a positive diagnostic criterion.

6) Duration of disease

The number of patients with the criterion of disease duration of more than 6 months was 141 (88.1%), and that with the disease duration of less than 6 months was 16 (10.0%); the disease duration was unknown in 3 cases (1.9%) (Table 5).

7) Selected method of treatment

Our summarization of the responses to the questionnaire, which was in multiple answers-allowed form, in relation to the selected method of treatment for each patient in the total of 160 cases (Table 5), showed that medical conservative (drug) therapy was the most commonly selected treatment: medical conservative (drug) therapy was selected in 135 cases (84.4%), diet in 107 cases (67.1%), and surgical treatment in 36 cases (22.5%). A total of 46 cases (28.8%) were treated by other methods, including home parenteral nutrition (intravenous hyperalimentation) in 33 cases (20.6%), and endoscopic intestinal decompression, ileus tube placement, and enema in a few cases. One case (0.6%) received no treatment (Table 6). The most commonly used drugs were mosapride citrate (5-HT4 receptor agonist), probiotics, daikenchuto (herbal medicine), magnesium oxide, etc. Antacids, such as proton pump inhibitors (PPI) and H2 receptor antagonists (H2RA) were sometimes used in the cases treated

conservatively.

As a result, 138 patients fulfilled all the diagnostic criteria, and the sensitivity of the proposed criteria for the diagnosis of CIPO in Japanese patients was 86.3%.

Discussion

CIPO is a serious digestive disease characterized by disturbance of intestinal propulsive motility, which results in clinical features mimicking mechanical obstruction, in the absence of any mechanical occlusion [1-5]. Long-term outcomes are generally poor with disabling and potentially life-threatening complications developing at a high frequency over time [9]. The diagnosis for CIPO is difficult and often delayed owing to the lack of biological markers and the symptomatic overlap with several other forms of digestive syndromes associated with similar gut motor dysfunction, but different natural histories. The delay for correct diagnosis leads to repeated, useless and potentially dangerous surgical procedures.

Whole-gut transit scintigraphy and antroduodenal manometry are often performed in Western countries to evaluate gastrointestinal motility disorders [2]. In 1999, Di Lorenzo C proposed an algorithm for the evaluation of patients presenting with signs and symptoms suggestive of pseudo-obstruction [10]. According to this algorithm, diagnosis of CIPO needs exclusion of mechanical obstruction by an abdominal x-ray series and/or contrast x-rays in patients with chronic signs and symptoms of bowel obstruction, and also exclusion of potential underlying causes of pseudo-obstruction. Manometory, scintigraphy and exploratory surgery with full-thickness biopsy are not absolutely necessary for the diagnosis, but may help confirm the diagnosis. On the other hand, Brian E. Lacy have proposed yet another diagnostic algorithm [11]. For the diagnosis of CIPO, patients should have had symptoms for at least 6 months, and a stepwise approach is used to make the diagnosis of CIPO, generally including laboratory studies, radiological studies to exclude mechanical obstruction, tests to measure the gastrointestinal transit time, and if necessary, specialized tests of gastrointestinal motility, such as esophageal and antroduodenal manometry. In summary, previous algorithms emphasize that the diagnosis for CIPO requires at least chronic symptoms of bowel obstruction and exclusion of mechanical obstruction, and if necessary, manometry, scintigraphy, etc. to confirm the diagnosis.

On the other hand, full-thickness biopsy of the small bowel should be performed in all patients with severe dysmotility of unknown etiology who are scheduled to undergo surgery for any reason, because of its potential to elucidate the pathophysiology of CIPO. Adoption of this procedure has revealed that neurogenic CIPO can be classified into two major forms, including degenerative neuropathy with hypoganglionosis, characterized by evidence of damage and/or marked reduction of the ganglion cells in the intestinal wall and inflammatory neuropathy characterized by myenteric infiltration by inflammatory cells, and that myogenic CIPO is

characterized by fibrosis or vacuolization of the inner circular muscle and/or longitudinal muscle of the intestine [12-14]. Although full-thickness biopsy may not be absolutely necessary for the diagnosis, it is an important procedure that helps to confirm the diagnosis of CIPO.
As mentioned above, gastrointestinal motility function tests, including whole gut transit scintigraphy and manometry, and exploratory surgery with full-thickness biopsy of the small bowel are important; however invasive in terms of tolerability in patients. This is the reason why we were prompted to develop diagnostic criteria that would not necessitate the use of these special examinations.

Although a few diagnostic algorithms have been reported, no clear diagnostic criteria for CIPO have been established anywhere in the world. Iida et al. revealed that it took an average over 7 years from the initial symptoms before a correct diagnosis of CIPO could be established, and therefore emphasized the importance of a greater degree of awareness about this disease among physicians and the necessity of the establishment of diagnostic criteria in order to shorten the period from the initial symptoms to correct diagnosis [8]. Therefore, Hongo et al., who were co-researchers of the Survey Group, drafted interim diagnostic criteria based on reference to several textbooks and case reports. In addition, they discussed the usefulness of the interim diagnostic criteria with other collaborators specialized in gastrointestinal motility disorders, soliciting their opinions by e-mail, and laid down the proposed diagnostic criteria as shown in Table 1. In this study, we investigated the clinical features of 160 patients and examined the validity of the proposed diagnostic criteria by calculating their diagnostic sensitivity in these patients. All the registered patients were diagnosed as CIPO based on the findings on plain abdominal X-ray, CT imaging, gastrointestinal endoscopy, and where necessary, barium enema and small-bowel follow-through. None of the patients underwent manometry, scintigraphy or exploratory surgery with full-thickness biopsy. Of the 160 patients, 138 patients fulfilled all the diagnostic criteria, and the sensitivity of the proposed criteria for the diagnosis of CIPO in Japanese patients was 86.3%. If the criteria included only 'No evidence of structural disease' (criterion 4) and 'Showing at least one of abdominal pain and abdominal bloating in the previous 12 weeks' (criterion 2), they would have shown higher sensitivity, but lower specificity, because patients with chronic constipation might be included as false-positives. However, most of these false-positives could be excluded based on criterion-1 of 'Onset of one or more symptoms of bowel obstruction at least 6 months prior to the diagnosis' and criterion-3 of 'Dilatation and/or air-fluid levels of the bowels on plain abdominal X-ray, echo and/or CT images'.

The recognition rate of CIPO is not more than 92%, even in specialized gastroenterology institutes in Japan, which is not optimal. There seems to be an even poorer recognition rate among physicians and surgeons who are not specialized in gastroenterology. The recognition

rate of CIPO in foreign countries also does not seem to be too satisfactory, given that no large-scale epidemiological studies have been reported and no clear diagnostic criteria for CIPO have been established. A greater awareness of the clinical features of CIPO among physicians would help limit unnecessary surgical procedures to the minimum.

Both the proposed diagnostic criteria and previously described diagnostic algorithms have their own advantages and limitations. Previously described diagnostic algorithms are superior in terms of their allowing systematic differential diagnosis; however, they are difficult to use for general physicians, and need specialized invasive examinations. On the other hand, the proposed diagnostic criteria are superior to the previously described algorithms in terms of their ease of use for the diagnosis of CIPO by the general physician without specific examinations, and also their ease of use in clinical practice; however, inferior to the previously described algorithms in that they do not provide a stepwise diagnostic approach or systematic differential diagnosis. New diagnostic algorithms are needed that can complement the shortcomings of the proposed diagnostic criteria and can be used in combination with them.

The main limitation of this study is the lack of a previous gold standard with which to compare the results, and the lack of assessment of fulfillment of the criteria among other gastrointestinal motility disorders. The most important aim of establishing the diagnostic criteria is to shorten the interval from the initial symptoms to correct diagnosis and referral to a specialist, and to minimize the performance rate of unnecessary surgical procedures. Improved recognition of CIPO and practical use of the diagnostic criteria are urgently desired. In addition, further investigation is required to determine whether or not the proposed diagnostic criteria might also show a high sensitivity for patients in other countries. The proposed diagnostic criteria should be appropriately modified by consultation with many researchers to make them more practical and internationally applicable.

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Conflicts of Interest

None

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Figure legends

Figure 1 Abdominal radiograph: marked distention of the intestine filled with a large amount of intestinal gas.

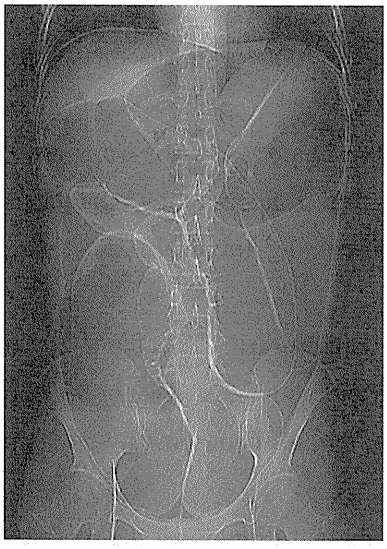

Figure 2 Abdominal CT: markedly dilated intestinal loops and multiple air-fluid levels are observed. Small intestinal gas occupies the greater part of the abdomen.