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ORS is never enough: physician rationales for altering standard treatment guidelines when managing childhood diarrhoea in Thailand

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Abstract

This study explores Thai physicians' rationales about their prescribing practices for treating childhood diarrhoea within the public hospital system in central Thailand. Presented first are findings of a prospective clinical audit and observations of 424 cases treated by 38 physicians used to estimate the prevalence of sub-optimal prescribing practices according to Thai government and WHO treatment guidelines. Second, qualitative interview data are used to identify individual, inter-personal, socio-cultural and organisational factors influencing physicians' case management practices. Importantly, we illustrate how physicians negotiate between competing priorities, such as perceived pressure by caretakers to over-prescribe for their child and the requirement of health authorities that physicians in the public health system act as health resource gatekeepers. The rationales offered by Thai physicians for adhering or not adhering to standard treatment guidelines for childhood diarrhoea are contextualised in the light of current clinical, ethical and philosophical debates about evidence-based guidelines. We argue that differing views about clinical autonomy, definitions of optimal care and optimal efficiency, and tensions between patient-oriented and community-wide health objectives determine how standard practice guidelines for childhood diarrhoea in Thailand are implemented.

Keywords: Childhood diarrhoea; Oral rehydration therapy; Thailand; Clinical guidelines; Decision-making

Introduction

Diarrhoeal disease remains a major cause of death among children throughout the developing world (WHO/CAH, 2001; WHO, 1998; Murray & Lopez, 1996; Ittiravivongs, Songchaitratna, Ratthapalo, & Pattera-arechachai, 1991). In Thailand, the mortality rate for children under 5 years due to diarrhoeal diseases steadily declined between 1990 and 1999, from 20 to 5.2 deaths per 100,000 population (Division of Epidemiology, Ministry of Public Health, Thailand, 2001). However, it remains the sixth major cause of all age mortality (Ministry of Public Health (MOPH), 1994), and contributes significantly to childhood death despite major initiatives undertaken by the Thai Diarrhoeal Diseases Control Program throughout the 1980s and 1990s in line with WHO guidelines (MOPH, 1991; Wongsaroj, Thavornnunth, & Charanasri, 1997; WHO/CDD, 1994; WHO/CDR, 1995). Moreover, surveillance data collected during 1990–1999 suggest increasing prevalence of morbidity from 5.1% to 7.1%; while nearly 40% of all diarrhoea cases and 26% of deaths due to diarrhoea were children aged less than 5 years (Division of Epidemiology, Ministry of Public Health, Thailand, 2001).

WHO treatment guidelines for childhood diarrhoea followed the discovery that dehydration from acute

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diarrhoea can be treated by oral hydration using a single fluid. Oral Rehydration Salts (ORS) dissolved in water to form ORS solution is absorbed in the small intestine, replacing water and electrolytes lost in the faeces, and is recommended by WHO as a safe and effective treatment which can be administered at home or at medical centres (WHO/CDR, 1995). Thus, a central policy of the Thai Diarrhoeal Diseases Control Program (TCDD) since 1981 has been to promote oral rehydration therapy (ORT), either by ORS solution or other fluids, accompanied by adequate food intake, to reduce dehydration and diarrhoea-related malnutrition (Cao et al., 2000). Specifically, the TCDD recommended every child with diarrhoea be prescribed ORT. A generic form of ORS, called WHO-ORS, was manufactured in the 1990s by the Government Pharmaceutical Organization of Thailand with funding from WHO/UNICEF and supplied free to all regional public hospitals. Several commercial products such as Oreda® and Olyte-dek®, which differ from the generic ORS in taste and ease of preparation, were also available. The TCDD also recommended the establishment of Diarrhoea Treatment Units (DTUs) in public provincial hospitals, and ORT Corners in smaller primary care health facilities to routinely treat acute childhood diarrhoea.

Through these initiatives, the Thai Ministry of Public Health sought to reduce diarrhoea-linked illness and death in children by increasing ORT use to 80% by 1995 (MOPH, 1991). However, between 1978 and 1991 the use of ORT only increased from 27% to 47% (Charanasri, Pornputtkul, & Wongsaroj, 1995), while a more recent survey of household clusters across 12 Thai provinces found that ORS solution use was 26% with other recommended home fluids at 36% (Wongsaroj et al., 1997). Further program evaluations over this period raised significant concerns that health workers were not following government guidelines in diarrhoea case management, did not accept ORS as a principal treatment strategy, and that antimicrobials were over-prescribed leading to treatment failure, increased antimicrobial resistance, higher health care costs and other side effects (Bajalil & Calva, 1994; Charanasri et al., 1995; MOPH, 1991). We undertook intensive fieldwork in Central Thailand to document the prevalence of sub-optimal prescribing and quality of care offered to children admitted as inpatients or outpatients to government hospitals suffering from diarrhoea. Importantly, our investigation sought to explain cultural, clinical and organisational processes influencing management of children with diarrhoea.

Methods

Combined quantitative and qualitative methods were used to collect data on the management of childhood diarrhoea in the two general and eight community hospitals providing residential care in a Central Thailand province. In Phase 1, a prospective clinical audit and structured survey estimated the prevalence of sub-optimal prescribing practices and quality of care using indicators developed by the International Network for Rational Use of Drugs (WHO, 1993). In Phase 2, qualitative methods, including in-depth interviews with physicians and key informants, and participant observation within the 10 hospitals, identified individual and system-level factors influencing prescribing behaviour and quality of care practices.

A research team led by the first author completed a prospective clinical audit of management of 424 cases of children under 5 years sampled from all 38 doctors treating diarrhoea in the provincial hospitals (see Howteerakul, 1997 for sampling details). The audit estimated prescribing for ORS and intravenous fluids for mild diarrhoea, and the over-prescribing of antimicrobials and other symptomatic drugs such as antidiarrhoeals, antiemetics and antispasmodics (polypharmacy). Quality of care was assessed via structured observation of doctors' assessment of diarrhoea cases, the quality of care given to caretakers about ORS, and advice about case management at home and diarrhoea prevention. The 424 caretakers of children awaiting treatment for diarrhoea were interviewed by the investigator using pre-coded and structured open-ended questionnaires before and after their child received treatment in public hospitals. Prior to treatment, caretakers were asked 13 questions covering the child's medical history with this episode, symptoms (e.g., stool characteristics, fever, vomiting), dietary management (e.g., type of fluid/food given, increase in fluid/food), home management practices (medicines given; name/dose/frequency) and caretaker's treatment seeking practices.[1] After the consultation, caretakers were asked 16 questions about the caretakers' experiences in the clinic (e.g., Did the doctor examine your child?), knowledge of how to administer drugs given and ORS, satisfaction with care, and reasons for any dissatisfaction. Observations of routines in public hospitals and informal conversations with caretakers and hospital personnel such as nurses and lab technicians (recorded as field notes) alerted researchers to significant issues which could be further explored in the Phase 2 qualitative investigation.

The qualitative methods of observation and in-depth interview sought to identify and explain socio-cultural, clinical, organisational and contextual influences on physicians' quality of care and prescribing practices. A

[1] It is beyond the scope of this paper to deal comprehensively with data collected through caretakers' interviews. Our primary focus is physicians' rationales for prescribing and treatment decisions, including physicians' perceptions of the beliefs, attitudes and demands of caretakers.

"qualitative contrasting groups framework" (Porteous, Higginbotham, Freeman, & Connor, 2001) was used to identify samples of physicians within the 10 provincial public hospitals who were stronger and less strong adopters of treatment guideline criteria. The qualitative contrasting groups framework is analogous to a case-control design, with subjects chosen from opposing or extreme groups on a selected behavioural outcome of interest measured on an ordinal or interval scale. The outcome of interest for this study was adherence to the Thai government's guidelines for the management of childhood diarrhoea.

Physicians were ranked using six prescribing criteria from which an overall score was derived in order to contrast doctors who were most and least consistent adherers to the guidelines. Equal weight was given to each of the following criteria: prescription of ORS for all cases; avoidance of antidiarrhoeals and antiemetics; restricting use of antimicrobials to bloody diarrhoea; not using injections with outpatients; and, intravenous fluids (IV) use with serious cases only. Sixteen doctors were purposively chosen for in-depth interviews (Patton, 2001): eight from the most adherent, and eight from the least adherent groups. These groups were judged to represent divergent views and practices, enabling us to collect rich qualitative data on a broad range of ideas, philosophies and ethical beliefs underlying clinical work.

In-depth interview guides were used to explore doctors' personal knowledge, beliefs and practices and allow the clinicians to tell their own story about the following topics: knowledge of diseases in the community and caretakers' perceptions of diarrhoea; attitude towards diarrhoea patients; facilities for diarrhoea cases; use of other drugs; influence of patient expectations; caretakers' knowledge and attitude towards ORS; promotion and use of ORS; professional's role in educating caretakers; role of pharmacists; prescriber education about therapeutics; patient load; working relations among hospital staff; and private sector influences on practices.

In-depth interviews were also carried out with key informants whose detailed knowledge of social, cultural and clinical processes could help us understand the hospital as a complete system. Key informants included: administrators, pharmacists, ORT corner nurses, nurses assigned to in-patient wards, technicians, pharmaceutical representatives and non-professional hospital staff. Finally, full participant observation was carried out for at least a month in four hospitals. Two facilities were actively engaged in diarrhoeal case management innovations while two were less innovative. During this time, the first author observed hospital activities, undertook systematic conversations with a range of personnel engaged in diarrhoea management and related promotional activities. Understandings from these observations helped to link together data about prescribing from other sources.

Prescribing audit findings

The prescription audit found that nearly all 424 child cases (91.3%) received ORS. However, ORS was routinely prescribed (94.6%) with other drugs or intravenous fluids in contravention of the standard treatment guidelines. Among 387 patients given ORS, 52% received WHO-ORS. The remainder received a commercial product with the standard ORS formulation. No unacceptable commercial electrolytes or sports drinks that have higher glucose and lower sodium levels than standard ORS formulas were prescribed for children. Nearly all physicians accepted the efficacy of ORS in correcting dehydration; many chose to prescribe commercial formulations rather than the recommended WHO-ORS, in combination with other medicines.

Medicines were over- rather than under-prescribed for childhood diarrhoea. The number of drugs ranged from 1 to 8 medications with a median of 4 (mean = 3.76).[2] Antimicrobial use was the most serious area of inappropriate prescribing; of the 363 children who received antimicrobials, 75.5% were incorrectly treated according to standard treatment guidelines. Most doctors studied routinely prescribed antimicrobials even for non-bloody diarrhoea with cortimoxazole the most commonly prescribed antimicrobial (51% of all cases). A trend was found towards prescribing norfloxacin as a first-line antimicrobial (11.1%), which WHO does not recommended for children due to possible bone cartilage side affects.

Similarly, antiemetics and antispasmodics were given to relieve symptoms in 34.2% of the 424 cases. Antiemetics were used to eliminate vomiting and stomach pain, and are mostly given to older children; prescribers are aware of antiemetics' adverse effects with infants. The guidelines do not recommend their use for any child except in rare circumstances. Use of antidiarrhoeals was lower than anticipated (18.4%); yet, more than half (23/38) of the doctors prescribed antidiarrhoeals for some cases. Adsorbent use to make the stool firm or stopping diarrhoea with antimotility drugs is known to be dangerous to children under five.

While all 6 severe dehydration cases received intravenous fluids (IV), 26.7% (113/424) of children with no dehydration or moderate levels were also prescribed IV. Whilst the health consequences of this practice are not serious, it is considered by authorities to be a waste of resources. A small percentage (2.4%) of patients also received inappropriate drug injections (excluding IV).

As expected, drug prescribing practices for diarrhoea episodes were different for inpatients and outpatients. However, practices in general vs. community hospitals were similar despite the fact that general hospitals care for more severe cases. Overall, our audit data indicate

[2] ORS and IV were counted as drugs.

that the TCDD strategies have raised the level ORS prescribing in Thai government hospitals, but only 15% of prescriptions adhered completely with national treatment guidelines. Adherence was strongest amongst doctors who had paediatric training or had attended diarrhoea case management education.

Personal, inter-personal and contextual influences on ORS prescribing

We now analyse how individual, inter-personal and organisational factors influence the pattern of prescribing described above. Drawing on in-depth interviews, we discuss how socio-cultural, economic, organisational, clinical, and ethical factors affect Thai clinicians' management of childhood diarrhoea. A major focus is physician ambivalence towards government practice guidelines. Standard practice guidelines are an important clinical resource for physicians and a key quality management tool for health authorities. A consensus is yet to be reached among health authorities and the medical profession about the extent to which guidelines should be adhered to by clinicians who reserve the right to exercise clinical judgment to provide optimum care for their patients. Our analysis of the rationales underpinning Thai physicians' attitudes to standard practice guidelines for childhood diarrhoea is informed by current debates in the literature about the use of evidence-based clinical guidelines generally. The medical system in Thailand (and elsewhere) is embedded in a socio-cultural context involving competition for scarce economic, status and knowledge resources. The Thai health system comprises public and private hospitals and clinics, traditional and informal health sectors, neighbourhood drug stores and street vendors. Most Thai physicians working in public hospitals also have private clinics and compete for professional prestige and income.

Value, status and cost

Prescribing patterns for childhood diarrhoea are influenced by perceptions about the value, status and cost of the various types of ORS available in Thailand. ORS is available both as a low-technology medicine and as a lifestyle product (sports drink), reducing its status in the eyes of both caretakers and prescribers. The generic WHO-ORS was introduced by authorities to ensure the efficient use of resources in public hospitals and during the study period (1994–1995) was provided free to caretakers. However, children generally found its unflavoured taste unpalatable. WHO-ORS presentation in large packets, which must be consumed within 24 h, reduced its value in the eyes of nurses and caretakers who were required to administer it to infants by spoon rather than by bottle. Whilst WHO-ORS was cheaper for public hospitals to obtain, the ambivalent status of ORS as a non-exclusive, low-technology, inexpensive medicine, and the fact that infants were unable or unwilling to swallow the salty-tasting liquid, meant it was not well accepted by either prescribers or caretakers. Thus, ORS had poor cost-efficiency for the health system overall. Several of these issues were alluded to by a doctor in the less-adherent group:

> Now this hospital uses only WHO-ORS, but in the next fiscal year the hospital will have enough budget to provide orange flavoured ORS (Oreda®). Indeed I am not happy to prescribe WHO-ORS. It is the cheapest electrolyte. Also it is the policy of Control of Diarrhoeal Diseases Program. In my private clinic I always prescribe orange flavoured commercial electrolyte (in packet). In some cases, I prescribe bottle electrolyte (i.e., Peptalyte®)… It tastes like coconut juice. The children like to take it.

For this physician, the deficiencies of WHO-ORS were substantial, but could be overcome with more hospital funding. The physician's local and culturally informed knowledge of what would appeal to the taste of Thai children—the traditional taste of coconut, often made into dessert (Hoge, Bodhidatta, Tungtaem, & Echeverria, 1995), and the Western-influenced taste of orange—informed his clinical judgement about the "value" and appropriateness of particular forms of ORS.

On the other hand, a doctor in the more adherent group felt that prescribing WHO-ORS was preferable to caretakers choosing from an array of commercial alternatives, some of which were unsuitable for children:

> Before coming to this hospital, the mothers give commercial electrolyte purchased at a drug store or received from illegal private clinics. That is really not acceptable. It often has too much glucose and not enough sodium.

Advertising of commercial electrolytes and brand name ORS informs consumer expectations and during the doctor–patient interaction may influence prescribing practices.

Whilst not benefiting directly from prescribing decisions made in public hospitals, a reputation for satisfying caretakers' demands in the public sector can boost prestige, resulting in increased numbers of patients attending the physician's private clinic. A doctor from the less-adherent group noted:

> I have to treat mothers rather than the child. Mothers look anxious when they see their child continuing to pass many watery stools

Doctors from this group perceived that caretakers wanted intravenous fluid for their child because they believed it produced a quick recovery. However, this explanation was not universally accepted. Doctors from the more adherent group felt that caretaker pressure was not an important factor. Rather, they noted that their colleagues made the decision to prescribe IV without the caretakers having to ask: "They do it automatically, not as a response to patient demand".

Social, symbolic and medical costs

Many families visiting public hospitals lived in remote areas; it was not unusual for those families to travel for more than 1 h before waiting another 1–2 h to be treated. The standardised diarrhoeal clinical management practice was for ORT to be administered to the child by a nurse or other health worker and the caretaker handed a blank prescription before waiting to be seen by the doctor. These organisational and structural conditions of the health system strongly affected prescribing patterns.

For caretakers and the doctor, the prescribing encounter took the form of an exchange in which the cost to the caretaker, in terms of sacrifice of time and income in bringing a sick child to the hospital, must be repaid in some meaningful way. The practice of health workers or nurses dispensing ORS followed by a long wait to see the doctor contributed to expectations that something additional would be provided by the doctor during the encounter, to avoid the caretakers feeling short changed. In addition, doctors may decide to prescribe other drugs in addition to ORS because worsening symptoms would mean a time consuming second visit. As a doctor from the less-adherent group noted:

> If I prescribe only ORS, it sounds like they received no treatment. Also, antipyretic drugs can be used in the future if their child has a fever.

Another physician from the less-adherent group believed that prescribing ORS alone was inadequate because unsanitary household conditions and a low level of caretaker education, might later result in the child acquiring infectious diarrhoea leading to severe dehydration:

> They spend a long time travelling. Furthermore, I cannot follow up these cases. So I prescribed ORS with antimicrobials or with other symptomatic drugs.

For these physicians, clinical reasoning was tempered by consideration of socio-cultural and environmental circumstances.

Caretakers' expectations

Physicians prescribe medications in addition to ORS because of the need to protect the child, to protect their own reputation and to satisfy caretakers' expectations. Even a doctor from the more adherent group was mindful of these pressures:

> I do not know about reactions to me about not prescribing poly medicine, but I always hear caretakers' feedback about prescribing of other doctors from previous sources of treatment—both when they are satisfied and when they are not satisfied with the prescription.

Indirect pressure of this nature, rather than caretakers' formal requests for drugs, influenced the Thai doctors' prescribing. Observations of the prescribing encounter during the audit confirmed this evidence: only 4.8% of 370 encounters analysed[3] involved caretakers openly requesting a specific medicine, and about half of those were for drugs for conditions not related to the diarrhoea.

Similar patterns of satisfying caretakers' generally unspoken expectations by supplying just-in-case prescriptions for antibiotics have been reported in studies of prescribing for children with upper respiratory infections in the UK (Cates, 1999) and for otitis media in the USA (Mangione-Smith et al., 2001).[4] The British and American physicians' rationales were similar to those expressed by our Thai physicians: "contingency" prescribing was viewed as a safety net or insurance policy which could be used if the child's condition deteriorated. Concern for professional status and income that were important considerations for the Thai physicians also influence their western counterparts: "In the current competitive marketplace, many physicians worry that if they do not satisfy patient desires for medications, the patient will go elsewhere for care" (Schwartz, Soumerai, & Avorn, 1989). Clearly, this kind of pressure on physicians' prescribing transcends cultural boundaries.

Valuing status and cultural preferences

Physicians' prescribing practices were often tempered by a perception that socio-economic status determined a caretaker's ability to choose what kind of ORS their

[3] While 424 caretakers were recruited for the pre-examination and exit interview questionnaires, the final 54 cases were not administered all questions. Hence, 370 cases were available for the prescribing encounter observations.

[4] Mangione-Smith et al. (2001) found that, while 50% of 295 caretakers expressed a pre-visit desire for antibiotics, only 1% made a direct verbal request for them. Nevertheless, the physicians perceived an expectation for antibiotics 34% of the time.

child received. A physician from the less-adherent group identified the important distinction between public and private hospital patient status:

> If the caretaker can afford to buy commercial electrolyte, I prescribe Peptalyte® (this is a ready-made oral electrolyte solution which tastes like coconut)… It is a good commercial product. Most caretakers who seek care from the public hospital are low-income people. Therefore, they are not choosy about the type of medicines they take, unlike caretakers who are in middle or high-income groups.

Cultural perceptions of illness, disease causation and treatment held by different status and income groups were also taken into consideration, as this physician from the less-adherent group described:

> The lower income people demand that doctors prescribe poly medicine, injection and intravenous fluid (IV). They believed that those medicines made them recover quickly from sickness… Their beliefs concerning poly medicines for sickness are too strong to change… I over-prescribed medicines to meet their demand. Middle income or educated people do not like the doctor giving injections to their child. Therefore, I will not prescribe for the children of these groups of people.

Caretakers' perceptions are usually the result of synthesising information from a variety of different medical models, including traditional folk beliefs and Western biomedical concepts communicated via health promotion campaigns. The traditional Thai view is that some episodes of diarrhoea are an expected part of childhood development, which is accepted if it only lasts a few days (Rauyajin et al., 1994; Choprapawon, Chunsutiwat, Kachondham, & Weiss, 1991).[5] Treatment is only sought if the child has a fever and vomiting or diarrhoea continues for more than 2–3 days. However, health promotion campaigns in recent years encourage caretakers to seek help earlier and have created expectations that early consultation will involve treatment with drugs.

While medical ideas may have replaced traditional views that diarrhoea is usually a self-limiting condition, the notion that dehydration is the principal danger (rather than infection or diarrhoea itself) has not been successfully conveyed.[6] Hence, the provision of ORS solution does not satisfy caretakers' expectations of what "modern" medicine can achieve (see Leslie, 1989), contributing to continuing pressure by caretakers for poly-pharmacy.

Organisational pressures

In addition to these individual and inter-personal considerations, pressures arising from patterns of organisation within the public hospital system also affected childhood diarrhoeal management and prescribing practices:

> I have very limited time to explain to caretakers because of the caseload. I cannot prescribe ORS alone. I prescribed ORS with other medicines.

This doctor (less-adherent group) felt that if staffing levels were increased, he would have more time to explain the proper dose and ways to administer ORS, so that it would be seen by caretakers to work effectively and reduce the demand for other medicines.

While the public hospitals were under pressure to contain costs by implementing standard treatment and prescribing guidelines for childhood diarrhoea, reducing costs by under-staffing undermined this aim; it increased time pressures on doctors which provided justification for non-adherence to guidelines. Staff-load and time pressures were especially important in the smaller community hospitals:

> Due to the caseload and my administrative job, I try to treat the patients as quickly as possible… If I have a meeting outside the hospital such as in the provincial health office or with the administration, there will be lots of patients waiting to see me when I get back, so I try to assess them as quickly as possible…

Clinical issues

Clearly, numerous influences affect prescribing patterns which seem far removed from the evidence-based clinical considerations underpinning guidelines. However, clinical decision-making, and its theoretical and ethical frameworks, are enormously important. A fundamental issue is whether decisions should be made primarily on the basis of scientific evidence or from multiple evidence sets. This is particularly crucial in situations of diagnostic uncertainty. A contentious issue is the right of health authorities to implement guidelines to improve the consistency of prescribing for a disease, vs. physicians' right to make clinical sense of each case,

[5] Choprapawon et al. (1991) identified several culturally determined understandings of diarrhoeal illness in central Thailand: *tong-sia* was a general term for diarrhoea; *bid* was associated with colicky pain; *ahiwa* referred to severe illness, including cholera; and *taae-tua* (*tai-tua* or *su*) was viewed as part of the normal childhood development.

[6] In response to two questions about the amount of fluid and amount of milk/food given since onset of diarrhoea, 96% of 370 caretakers responded 'the same amount but the child takes less than usual' (see footnote 3).

rather than placing it in a general category of cases (Tanenbaum, 1993).

Interpreting guidelines using clinical judgment

Clinical practice guidelines are based on a synthesis of current evidence and recommendations of expert clinicians (Choudhry, Stelfox, & Detsky, 2002). However, evidence-based guidelines have been criticised on the basis that they pre-suppose an "average patient rather than a particular patient", and are aimed at treating a disease rather than a whole person. Thus, many Western physicians reserve the right to use clinical judgement to interpret evidence-based guidelines in the light of their knowledge of particular kinds of patients in particular settings (Hurwitz, 1999):

In our study, locally informed experiential knowledge shaped the clinical judgment of a doctor in the more adherent group that there was too much salt in WHO-ORS for routine child cases. In his opinion, the WHO-ORS formula (Na = 90 mmol/l) might be suitable for severe diarrhoea that would be found in India or Bangladesh, but was not suitable for routine child cases because it would lead to hypernatraema—a net loss of water caused by an excess of sodium. At the time of this study, the range of acceptable levels in WHO guidelines was 50–90 mmol/l, with the WHO-ORS formulation at the top of the range. This doctor felt it would be acceptable to "use a lower sodium concentration in mild cases".

While the WHO guidelines retain some flexibility through recommending a range of salt levels, adherence dilemmas arise because translation of those recommendations into practical reality in the Thai public hospital system involved the manufacture and supply of just one officially sanctioned electrolyte (WHO-ORS) with (Na = 90 mmol/l of sodium, 111 mmol/l of glucose and total osmolarity of 311 mmol/l).[7] Cook and Giacomini (1999) in the USA argue that "most guidelines require adaptation to the local environment". However, the process of translating WHO-ORS guidelines into a single approved product has introduced an unintended rigidity affecting physicians' ability to modify standard treatments for particular sub-sets of patients in local contexts, using clinical, experiential judgment.

Uncertainty of diagnosis

Another clinical issue affecting adherence with guidelines is uncertainty surrounding diagnosis. Clinical guidelines are predicated on assumptions of certainty between cause and effect. However, the often complex, individualistic circumstances surrounding particular cases mean that "uncertainty and subjectivity" are an integral part of the clinical encounter (Tanenbaum, 1993). Like Western doctors (see Garfield & Garfield, 2000), Thai physicians regard prescribing as an art rather than a science. Thus, lamenting his inability to influence physicians' prescribing practices, a Thai pharmacist involved in diarrhoea management in a public hospital stated:

> For the new preparations of adsorbents, if I want to stop doctors ordering these medicines, I have to show acceptable sources of information such as manuals or journals. The doctors maintain that therapeutics is an art as well as a science and so sometimes they will appear to "over prescribe" according to the guidelines…

Clearly, though, "No physician can know a patient in his or her entirety or be certain what inferences to draw from aggregate studies" (Tanenbaum, 1993). Thai physicians we interviewed fear adverse outcomes both for the patient and for the professional's reputation. A physician from the less-adherent group noted:

> A child who passes many watery stools per day (with invisible blood at the time of the consultation) may be caused by bacteria such as *Campylobacter jejuni*. I am not confident to prescribe ORS. If something happens to the child, I have the responsibility for him.

Nearly all of the 38 study physicians used IV fluid for children suffering mild or moderate dehydration. The doctors were concerned about the potential seriousness of diarrhoea in young children who can drop blood pressure and become hypotensive even when dehydration appears to be moderate. Physicians' perceptions that ORS was hard to swallow, especially by children with persistent vomiting, lowered their confidence that sufficient rehydration could be achieved with ORS alone. A doctor in the less-adherent group said:

> I prescribe IV to a child with moderate dehydration because I am afraid that if something wrong happens to the child, this information will spread through the community very quickly. This would harm my reputation and that of the hospital.

Similar rationales were advanced in relation to prescribing antimicrobials. Doubts about whether a child had a hidden or secondary infection that was not visible during examination resulted in the conclusion that, to be safe, it was wise to prescribe at least first-line antimicrobials. Thus, a doctor from the more adherent

[7] Recent clinical studies also raise doubts about whether the standard formulation of WHO-ORS is the optimum sodium concentration (Hahn, Kim, & Garner, 2001). In 2002 the WHO recommendation for ORS was reduced to 75 mmol/l of sodium; total osmolarity 245 mmol/l (WHO/CAH, 2002).

group stated:

> For the viral diarrhoea, if it is not severe, I will not prescribe antimicrobials…if the child also has other complications such as upper respiratory tract infection or high fever and seems not to be getting better, it is safer to prescribe antimicrobials.

Diagnostic uncertainty was compounded by the Thai physicians' lack of confidence in laboratory results. Physicians were aware of the possibility of an error or low sensitivity in the laboratory tests (microscopic stool examination for white and red blood cells; and stool culture for bacterial pathogens);[8] and that if caretakers gave antimicrobials to a child before visiting the doctor, it could affect the results—producing a false negative. Kassirer (1993) notes, a diagnosis is not a single entity but rather "a group of related and competing possibilities". Laboratory tests do not make diagnoses infallible: "Some degree of uncertainty remains even after all possible tests have been performed" (Kassirer, 1993). Thai physicians' decisions not to comply strictly with standard treatment guidelines are more understandable when they are considered in practical clinical circumstances rather than theoretical contexts.

Ellrodt, Conner, Riedinger, & Weingarten (1995) report that in the United States a considerable amount of non-adherence is the result of clinical judgment overriding the guideline. Clinicians feel that guidelines based on randomised trials "Do not reflect the complexity of the real world, in which a decision's context and framework are important" (Garfield & Garfield, 2000). This rationale also appears relevant to the selective way the guidelines were implemented by the Thai doctors quoted above: local conditions and complicated medical scenarios are incorporated into "multiple consecutive decisions that characterise patient care" (Tanenbaum, 1993).

Modifying guidelines to suit local conditions

When uncertain about the presence of bacteria in diarrhoea cases, some of the Thai physicians interviewed used age as the key prescribing indicator. This local modification of the national guidelines was explained by a senior paediatrician from the more adherent group:

> In the hospital I have reduced the rate of prescribing antimicrobials from 70–80% to 50%. The criteria for prescribing antimicrobials for non-bloody diarrhoea is that if the child is less than 3 years… If the child is more than 3 years I will not prescribe antimicrobials.

Using evidence from multiple sources (cultural, experiential and scientific), this age-based compromise position was adopted as a form of self-regulation in a situation where the guidelines were judged not to be universally applicable.

Local adjustment of clinical guidelines is not uncommon in the developed world; it is likely to be made by the most experienced rather than the least experienced physicians (Garfield & Garfield, 2000). Reviews of Western practice patterns found that physicians are most likely to rely on their own experience or on recommendations of colleagues when deciding to adopt new innovations (Greco & Eisenberg, 1993). A Thai physician from the more adherent group also observed how the most experienced or highly trained physicians influenced their less experienced colleagues:

> When I was a medical student, my lecturer showed the medical students in the class about treatment guidelines of other diseases including WHO guidelines. She showed the students that the guidelines cannot cover every aspect of treatment all the time. Personally, in the same way for diarrhoea cases, it is possible to make mistakes if you only use visible blood as an indicator for prescribing antimicrobials. For outpatient cases, I still quite often prescribe first-line antimicrobials for non-bloody diarrhoea.

Although generally adherent with the guidelines, this physician did not feel obliged to follow them strictly, and had reached a compromise that she felt happy with. While regularly using ORS she "also considered other complications and the possibility of secondary infection". Woolfe and colleagues note:

> Guidelines that are inflexible can harm by leaving insufficient room for clinicians to tailor care to patients' personal circumstances and medical history. What is best for patients overall, as recommended in guidelines, may be inappropriate for individuals. (Woolf, Grol, Hutchinson, Eccles, & Grimshaw, 1999)

Modifying the universal guidelines to suit local conditions and contexts requires a highly skilled synthesising of evidence-based guidelines and biomedical knowledge with other experiential, intuitive and contextual ways of knowing to form a clinical judgment.

[8] The most common laboratory tests performed during this study were microscopy and culture on a single stool specimen (17.9% and 16% of 424 patients, respectively). Only two general hospital laboratories had facilities to perform stool culture. Stool specimens from community hospitals were sent to the largest general hospital laboratory.

Practicality of guidelines

Why are Thai physicians not more influenced by clinical guidelines? A key theme that emerged from the interviews was that the doctors did not agree with all the guidelines from WHO because "they are not practical". Instead, guideline application was assessed in the light of empirical experience of the outcome of particular treatments or feedback from caretakers. A physician from the less-adherent group explained:

> When giving treatment to the patients one should also consider their satisfaction. In some cases, if I do not prescribe antimicrobials, or antidiarrhoeals, the patient will not be happy. For severe cases, although I prescribe many medicines at a time, diarrhoea will not stop. How can I prescribe ORS alone? Policy makers are not practicing physicians, they do not really know the problems. The strict guidelines are not practical.

Another doctor from the less-adherent group also highlighted practical difficulties in implementing guidelines:

> Doctors who are policy makers do not have their own clinics. Also they are not practicing physicians, they do not know the problems when dealing with caretakers in private practice. Patients come to the clinic with the expectation of quicker service and better medicines.

This view resonates with that of Western physicians. Greco and Eisenberg (1993) argue that one reason that clinical guidelines "have been remarkably unsuccessful in influencing physicians" in the USA is that the "guidelines are not written for practising physicians, but focus instead on the current state of scientific knowledge". They suggest that clinicians may find it difficult to apply guidelines based on this kind of evidence to specific patients and "may disagree with or distrust guidelines written by so-called national experts" (Greco & Eisenberg, 1993).

Tanenbaum (1993) has noted that standard treatment guidelines are formulated far from the practice site, and are based on the aggregation of information from statistical analyses of large databases. Guidelines represent a kind of "impersonal knowledge" as opposed to the personalised evidence accumulated from the physician's "experiential learning and the cause-and-effect reasoning of traditional medical science" (Tanenbaum, 1993). However, a distinction has been made between clinical guidelines formulated by experts and "integrated care pathways" which are locally determined for a specific patient group. Such pathways involve a critical evaluation of current practices and a review of all available evidence, leading to the development of "locally agreed guidelines"(Kitchener & Bundred, 1998).

Ethical considerations

In applying standard treatment guidelines and other protocols on behalf of health authorities, physicians arbitrate and judge the best possible course from amongst a range of competing priorities and demands. Physicians must take into account caretaker preferences and act in accordance with their own professional and ethical standards and economic imperatives, whilst contending with pressures from health authorities and their peers to adhere to guidelines and best practice protocols. Reconciling these competing demands is made more difficult if conflict arises between the aims of guidelines to promote optimum care for all patients and optimum efficiency for the community as a whole and the physician's perceived responsibility of caring for individual patients and their families.

Patient and community-oriented perspectives

In deciding whether or not to adhere to childhood diarrhoea guidelines, the Thai physicians took account of several factors. Scientific evidence of what would bring about the best health outcome for the child was considered in the light of economic and status considerations of what would bring about the best outcome for the practitioner. Prescribing decisions were also justified in ethical terms as providing the safest alternative for a particular patient, after taking into consideration his or her environmental and sociocultural circumstances. All these issues come together in the notion of delivering "patient satisfaction". Thus, a doctor from the less-adherent group stated:

> Doctors should be concerned with patient satisfaction… they consult a doctor with the expectation of receiving medicines. Therefore, I never prescribe ORS alone.

Clearly, this doctor believed that his priority was to treat individual patients and to achieve an outcome satisfactory to the caretakers and to himself, even though this was in contravention of the guidelines. In contrast, WHO and Thai health authorities wished to encourage prescribing practices which would result in the best clinical outcome for each child, whilst also promoting optimal health and efficiency outcomes for the community as a whole. The dissemination of standard practice guidelines was one way of furthering this aim.

These priorities can be situated within two ethical frameworks. The first is deontological ethics or 'duty'

ethics, which can include the requirement that health workers act in the best interest of each individual patient, regardless of other obligations, provided this does not cause harm to others (Dossetor, 2001). The second is utilitarian (or consequence-based) ethics, aimed at providing "the greatest possible balance of value over disvalue to all persons who will be affected" (Beauchamp & Childress, 1989). These frameworks are used to evaluate the rightness and wrongness of various courses of action using ethical principles such as beneficence ('above all, do good'), non-maleficence ('above all, do no harm'), justice (fairness) and autonomy (exercise of self-determining choice) (see Johnstone, 1994). Dossetor (2001) argues that tensions arise if clinicians feel that their primary duty is to act in the best interest of individual patients, while program directors and health administrators are obliged to also pursue utilitarian goals.

Thai physicians' evaluations of what constituted safe, satisfactory and economically viable care were generally focused on the needs of specific patients, given their specific economic and social situation. In some cases, this entailed prescribing contrary to clinical best practice and contravened health authorities' aims of equitable health care outcomes. Thus, a doctor from the less-adherent group justified the prescribing of antidiarrhoeals, antispasmodics or antiemetics on the basis that they quickly alleviated the child's symptoms. He sought to reduce the economic burden on caretakers by minimising time lost which could otherwise be spent gaining income for the family. In his opinion,

> We should consider the cost of medicine which caretakers have to pay compared with income lost if they cannot work while their child is getting sick.

The prescription audit revealed that 35 out of 38 doctors prescribed antiemetics or antispasmodics and 23 out of 38 doctors prescribed antidiarrhoeals for some cases in contravention of the guidelines. Even though physicians were fully aware that antidiarrhoeals cannot shorten the duration of diarrhoea, they were prescribed to "satisfy caretakers" or for "safety" reasons. One doctor from the less compliant group stated:

> For mild diarrhoea cases, I sometimes prescribe adsorbents such as Kaopectin® and ORS in order to show the caretakers that I am giving adequate treatment for their child… It is safer for the child to receive adsorbents from the doctors rather than get antimicrobials from drug stores or other sources of treatment.

Ironically, safety was also a key factor underpinning the guidelines; antiemetics and antispasmodics are not recommended because they have been found to be unnecessary and could be harmful. The Thai physicians' justified their non-adherence to the guidelines by reasoning that prescribing adsorbents was likely to be "safer" than the alternative of caretakers purchasing "package drugs" sold by vendors at drug stores. Package drugs may contain assorted unlabelled and unidentified antibiotics, pain killers, antihistamines, and so forth (Boonmongkon, Nichter, Pylypa, & Chantapasa, 1998).

Antimicrobial prescribing guidelines have the deontological goal of providing the best possible clinical care for each patient, as well as the utilitarian goal of limiting community resistance levels which render antibiotics less effective. However, a communitarian public health rationale commonly advanced by Thai physicians for prescribing antibiotics contrary to the guidelines was to ward off potential problems from unsanitary living conditions. Hence, antibiotics were prescribed to 'treat' their patient's home environment. This deontological rationale advanced the priority of patient care, not only by treating the biological aspects of the disease, but also by creating a context for the child to get well through normalising their social and psychological environment. Through their discourse, doctors justified their actions as addressing health issues arising from disorganisation of the social body as well as from disorder of the patient's biological system (Lock & Scheper-Hughes, 1990).

Whilst most clinicians' prescribing rationales were consistent with a deontological framework, one influential doctor from the less-adherent group justified patterns of non-adherence on the basis that he needed to maintain good relations with the community in order to attract charitable donations when needed, for instance, for a new building or equipment, a utilitarian objective.

> I have to be flexible in prescribing medicines and applying criteria for admission. I do this to avoid having conflict with people in the community.

This physician's non-adherent prescribing may reduce Thai health authorities ability to distribute health resources equitably at the population level, but was justified as an action contributing to his own community's health infrastructure.

Health rationing as distributive justice

Utilitarian ethics emphasise maximising "the greatest good for the greatest number" (Berglund, 1998). The ethical principle of distributive justice is often applied to determine how to share a limited good. In our study, it took the form of using standard practice guidelines for childhood diarrhoea as a health resource rationing tool. In public hospitals, prescribing lactose-free milk to stop or reduce the number of watery stools was not recommended because of the cost. In private clinics,

no such rationing existed; however, economic imperatives still influenced prescribing, with the caretaker's economic status rather than hospital funding policy as the determining factor. These differences were outlined by a doctor from the less-adherent group who contravened the guidelines in a routine way in the public hospital: "I prescribe Prosobee® (lactose-free milk) for the child who drinks milk"; and selectively in his private clinic, "I prescribe this type of milk, if the mothers can afford to buy it". In both cases, the physician's view concerning the efficacy of the product for removing symptoms was the primary consideration, but his view was also tempered by economic considerations.

Resource rationing in public hospitals also took the form of limiting the availability of certain drugs and other treatments deemed non-essential. A variety of brand name drugs were available in private clinics, whereas the public hospitals were permitted to use only 20% of their budget for 'non-essential prescribing'. Physicians' decisions about which patients were prescribed these drugs were related to the cost to the government's social welfare budget, since patients had to pay for their own medicines unless assessed by a social worker as needing government assistance. In the private sector, these cost pressures were absent. Doctors had to consider patient preferences for medicines in terms of taste, dose and frequency in order to maintain the economic viability of their private clinic. Clinical efficacy was not always the first priority.

The competitive climate meant that even physicians from the more adherent group felt constrained:

> Many health workers reported that they couldn't follow the national treatment guidelines of the strict use of antimicrobials. Patients demand medicines due to previous experiences of treatment. If the health worker did not prescribe antimicrobial drugs for the patients, they would go to other clinics, quack doctors or not return to see them again.

Health resource rationing is an increasingly common reality faced by physicians working in public hospitals in both the developed and developing world. Tensions are created because pressure to act as health resource gatekeepers may require clinicians to 'serve two masters, their patients and the public good' (Levinsky, 1998).

Theoretical issues: competing rationales underpinning guidelines

Health authorities formulate and oversee the implementation of clinical or standard treatment guidelines for several reasons. One aim is to achieve optimal care through reducing harmful or unnecessary interventions and improving the quality of clinical decision-making. Another rationale is to gain optimal efficiency through cost control and resource rationing so that services and medicines may be more equitably distributed (Battista & Hodge, 1993; NHMRC, 1999). However, optimal efficiency can occur at the cost of optimal care, or vice versa (Mead, 2000; Woolf, Grol, Hutchinson, Eccles, & Grimshaw, 1999). Physicians charged with implementing guidelines face difficult decisions about which broad aim should take priority.

Tensions arose because the logic of clinical guidelines rests on the assumptions that clinical trial outcomes are reproducible in clinical practice and that adoption of evidence-based treatments produces optimal care for a whole population. However, these assumptions can fail when clinical guidelines are applied in less controlled clinical environments where treatment is not limited to a narrow group of patients, resources are constrained and patient adherence is unreliable (Haycox, Bagust, & Walley, 1999). Physicians' justifications of their prescribing practices suggest that, rather than consider the overall costs to the community, they approached the provision of optimal efficiency laterally. Doctors claimed their actions reduced the need for carers to seek unhealthy or unsafe alternatives.

Integrating influences on physicians' prescribing practices

The model in Fig. 1 shows how the physicians' prescribing attitudes and practices are shaped through an interactive process of reconciling pressures from two opposing external sources: caretakers' and patients' expectations; and, health authorities' imperatives. These two sources are combined with the clinicians' own internalised economic, professional and ethical priorities to produce the prescribing patterns we observed. The model describes the dynamic process leading to over-prescription of antibiotics, inappropriate use of antiemetics and antispasmodics, and the failure to educate caretakers about ORS.

Conclusion

Our findings highlight individual, inter-personal, community and system-level influences affecting the management of childhood diarrhoea. The devalued status of ORS was a major problem confronting physicians in the public hospital sector. Our results suggest this might be alleviated by changing the formulation of ORS and the way it is administered to enhance its value and status in the eyes of caretakers. The image of ORS could be transformed if ORT was not administered separately, but strongly associated with quality physician care. Methods for doing so, however, should avoid any delay in onset of ORT. Added to ORS formulation could be supplemental micronutrients, such as zinc, known to reduce duration of diarrhoeal episodes

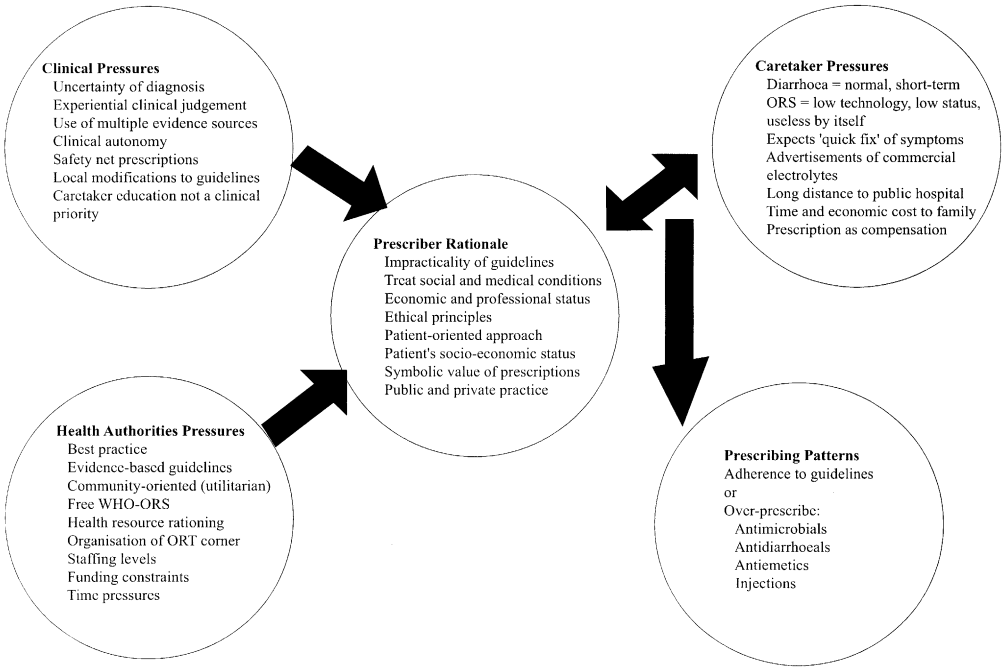

Fig. 1. Influences on physicians' management of childhood diarrhoea.

and prevent weight loss (Dutta et al., 2000; Khatun et al., 2001). Furthermore, the palatability of ORS could be improved by adding flavouring sensitive to cultural tastes (e.g., coconut).

Significantly, we observed that physicians' prescribing decisions draw upon multiple sources of evidence, not just the aggregated outcome data underlying clinical guidelines. Indeed, physicians relied upon experiential evidence, distinguishing between the goals of caring for individuals vs. caring for the health of populations, to selectively implement or modify guidelines. Barriers to adherence with guidelines might be creatively addressed through greater acceptance of the logic of complementarity of evidence from a variety of sources when evaluating quality of care and prescribing practices. Interestingly, Mead (2000) states: "Without research evidence clinical practice risks being out of date, and without clinical expertise practice risks becoming out of touch with reality". The expressions of the Thai physicians we interviewed appear to concur with these observations. At minimum, guideline developers need to overtly acknowledge the range of priorities held by stakeholders (physicians, service managers, caretakers) regarding what constitutes optimal efficiency and optimal care.

In conclusion, Thai physicians articulated a range of rationales for not adhering to clinical guidelines which were both context specific and universal. Economic and status considerations in a highly competitive health system were important motivators for non-adherence. However, many of their concerns resonate with current arguments in the Western literature concerning the right of physicians to use clinical judgement when deciding how guidelines are implemented. The Australian National Health and Medical Research Council (NH&MRC) guide to developing, implementing and evaluating guidelines supports this right: practice guidelines are "just one element of good medical decision-making, which also takes account of patients' preferences and values, clinician's values and experience, and the availability of resources" (NHMRC, 1999). Similarly, the USA Institute of Medicine supports the judicious application or adaptation of guidelines by physicians using their experience and clinical judgement (Field & Lohr, 1992; see also Mead, 2000). Such an approach seems a practical way of reconciling the tensions we observed between the various stakeholders dealing with childhood diarrhoea guidelines in provincial Thailand.

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