Original Article

Patients' and Relatives' Perceptions About Intravenous and Subcutaneous Hydration

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Abstract

Hydration during palliative care is a controversial topic. Most of the arguments are based on anedoctal reports that have not been substantiated with scientific data. Given that the choice is problematic from a clinical perspective, preferences of patients and family should dictate whether intravenous fluids are administered. The aim of this study was to evaluate patient and family perceptions about hydration and two modes of providing hydration. Fifty-four consecutive patients admitted to an acute pain relief and palliative care unit who required hydration completed a questionnaire regarding their perceptions on hydration and modes of hydration. Similarly, the principal family carer was chosen and similar questions were posed. For most items, patients and relatives agreed, considering hydration as a useful medical treatment that is able to provide some nutrition. The intravenous route was considered able to improve the clinical condition and to have a positive psychological meaning, representing an acceptable burden. The subcutaneous route was considered less effective, and not less bothersome than the intravenous route. Most patients and relatives agreed with continuing hydration at home, if necessary, preferring the intravenous route. Other than technical considerations, which can be variable according to the clinical setting, the perceived benefits of artificial hydration by the caregivers and patients are central to the ethical, emotional, and cultural considerations involved in their decision making. Most patients and relatives surveyed accepted and were in favor of intravenous hydration. J Pain Symptom Manage 2005;30:354–358. *© 2005 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.*

Key Words

Hydration, intravenous, subcutaneous, cancer patients, palliative care

Introduction

Hydration during palliative care is a controversial topic. Most of the arguments for or against it are based on anedoctal reports that have not been substantiated with scientific data. Dehydration can reduce intravascular volume and glomerular filtration rate, resulting in renal failure and consequently in accumulation of substances, including morphine metabolites. Dehydration is known to cause confusion and restlessness in patients with nonterminal conditions, symptoms that are often reported in advanced cancer patients and could be aggravated

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or caused by dehydration. Moreover, the risk of bedsores and constipation may be higher in dehydrated patients.[1] Some professionals argue that withholding intravenous fluids at the end of life can increase the patient's pain threshold, alter patient awareness, and increase azotemia.

In contrast to this view, hydration may have several drawbacks, such as fluid retention and increase in airway as well as gastrointestinal secretions. Arguments against rehydration traditionally have been that comatose patients do not experience symptom distress, parenteral fluids may prolong dying, less urine results in less need to void or use catheters, fewer gastrointestinal secretions may decrease nausea and vomiting, fewer secretions in the bronchial tree may decrease respiratory problems, dehydration may decrease edema and ascites, and "dehydration anesthesia" may occur through the accumulation of ketones and diminish discomfort.[2] Contrasting data have been reported on renal function in hydrated or non-hydrated patients.[3,4]

Intravenous or subcutaneous routes are traditionally used to provide fluids or drugs, and are alternative to the oral route. Intravenous hydration comes from the traditional medical model, and in the palliative care setting, many health care professionals have reacted negatively to the generalized use of intravenous fluids. Subcutaneous hydration may potentially offer advantages over the intravenous route, including easy access, less need of hospitalization, and relative duration of and more possibilities to change sites. In specific intensive settings, however, most patients have an intravenous line, not only to provide hydration but also to facilitate therapeutic interventions, such as dose titration, administration of rescue doses, and treatment of emergencies.[5]

It is not surprising that programs instituted to treat dehydration are not only determined by an objective assessment of clinical data, but by the attitudes of those involved with the decision. Given that the choice is problematic from a clinical perspective, the preferences of patients and families should dictate whether intravenous fluids are administered. The meaning attributed by patients and relatives to hydration and the modes to provide fluids is also important for their expectations and the possible psychological impact of this intervention. The aim of this study was to evaluate patient and family perceptions about hydration and two modes of providing hydration.

Methods

Eighty-two consecutive patients admitted to an Acute Pain Relief and Palliative Care Unit who required hydration were surveyed. Patients unable to cooperate, having neurological disturbances, or expected to have a short survival (less than 2 weeks) were excluded. After the initial assessment to select patients requiring hydration, 54 patients gave their informed consent to be interviewed and fill in a questionnaire. Concurrently, the principal family carer was chosen and similar questions were posed. Indications for hydration were recorded. Interviews were performed on the day of admission.

Statistical Analyis

Data were analyzed using the Chi-square test to compare frequencies in different groups (patients and relatives) and categorical variables. When the expected cell sizes were small, Fisher's exact test was used as an alternative to the Pearson Chi-square test. For frequency analysis, $2 \times X$ Cochran's test of linear trend was used to reveal whether proportions increase (or decrease) linearly across the ordered categories. For matched variables, the analysis was performed by McNemar's test for symmetry. All P values were two-sided and P values less than 0.05 were considered to indicate statistical significance.

Results

Patient characteristics are presented in Table 1. In Table 2, the principal indications for providing hydration in such patients are shown. Table 3 shows the answers of patients and relatives to the different questions. Patients and relatives did not respond to all the questions. For most items, patients and relatives agreed, considering hydration as a useful medical treatment, able to provide some nutrition, and able to be continued (particularly in the relatives' opinion). The intravenous route was considered able to improve the clinical condition and to have a positive psychological meaning, representing an acceptable burden.

Table 1
Patient Characteristics

Number of patients	54
Age, years	61.1 (range 25–86, 95% CI 57–64)
Karnofsky PS	49.62 (range 40–70, 95% CI 47–51)
Male/Female	31/23
Primary cancer diagnosis	
Lung	11
Urogenital	11
Gastrointestinal	10
Breast	4
Liver-pancreas	4
Head-neck	2
Others	12

The subcutaneous route was considered less effective and not less bothersome than the intravenous route. Substantially, subcutaneous hydration was not the preferred choice. Most patients and relatives agreed in continuing hydration at home, if necessary. They preferred the intravenous route, despite considering it more complicated than the subcutaneous route.

Discussion

Data from this study affirm that both patients and relatives consider hydration effective and most of them would desire it, regardless of the clinical evidence for efficacy. On the other hand, efficacy of hydration remains unsubstantiated with scientific data. Of interest, intravenous hydration was perceived to be highly effective from a clinical and psychological point of view, and this approach proposed as a routine was positively considered.

The subcutaneous route frequently has been reported to be the route of choice for the palliative care population. Hospice doctors are concerned that the use of intravenous fluids gives confusing messages to relatives about the role of medical intervention in advanced cancer patients. After a phase of decline and criticism, the intravenous route has regained popularity in the acute setting of palliative care for providing rapidity in treating symptoms and emergencies. Therefore, at least in an acute setting, an intravenous line is often used, and about 20% of patients have a central line or a subcutaneous port already inserted.[6] A correct level of hydration is sought in most patients and is considered as an essential part of care, particularly in patients with specific indications. Although all patients had an intravenous line for technical reasons as a part of the routine activity, both patients and relatives considered intravenous hydration more effective, with an acceptable burden, even for home care. Of course, health care professionals should keep in mind that patient autonomy is heavily influenced by the manner in which information is presented.

Table 2
Indications for Hydration

Clear signs of dehydration	41
Nausea/vomiting	8
Opioid toxicity	4
Diarrhea	1

Thus, data in favor of the intravenous route resulting from this survey could be influenced by the context of a palliative care unit, where most patients already had an intravenous catheter in place. On the other hand, the interview was done on the first day of admission and most of these patients did not believe, on the basis of previous experience, either hospitalization or home care, that the subcutaneous route would be more convenient or effective.

Different factors may influence caregivers, including issues of symptom distress, ethical and emotional considerations, information exchange between health professionals and family, and culture.[6] In an experiment performed in a university oncological setting in Israel, patients, relatives, and health care professionals expressed generally positive attitudes about intravenous hydration. Medication, giving fluids, and giving morphine were the most common stated reasons for intravenous therapy.[7] Different from the principle of the sanctity of life of the Jewish culture, beneficence and autonomy prevail in the context of Mediterranean culture, and nutrition and hydration are often placed in the same category. This belief also was confirmed in this survey, and possibly it contributed to the positive psychological impact for both relatives and patients.

From the technical point of view, when using the subcutaneous route, the duration from insertion has ranged 42–93 hours, depending on the use of a butterfly or a Teflon cannula, respectively.[8] This period is similar to the duration of a peripheral intravenous line in patients who do not have a central line (data not published). When using the subcutaneous route, there can be problems with site reactions

Table 3
Responses to the Questionnaire (%)

Question 1: How do you consider parenteral hydration?

	Useful	Not Useful	Bothersome	Other	*P*
Patients (51)	90.20	3.92	1.96	3.92	0.534
Relatives (47)	95.74		2.13	2.13	

Question 2: Do you think that hydration is also nutrition?

	Yes	No	*P*
Patients (47)	72.34	27.66	0.358
Relatives (46)	80.43	19.57	

Question 3: Do you think that hydration may improve your clinical condition?

	Yes	No	*P*
Patients (49)	93.88	6.12	0.641
Relatives (47)	93.62	6.38	

Question 4: Do you think that hydration may be useful psychologically?

	Yes	No	*P*
Patients (43)	93.02	6.98	0.525
Relatives (45)	91.11	8.89	

Question 5: Would you like to continue hydration for prolonged periods of time?

	Yes	No	*P*
Patients (28)	71.43	28.57	0.147
Relatives (36)	86.11	13.89	

Question 6: Do you think that hydration is an acceptable burden for your activity considering the possible advantage?

	Acceptable	Burden	*P*
Patients (48)	91.67	8.33	0.605
Relatives (45)	91.11	8.89	

Question 7: Do you think that the subcutaneous route is as effective as the intravenous route?

	Yes	No	*P*
Patients (38)	23.68	76.32	0.485
Relatives (39)	30.77	69.23	

Question 8: Do you think that the subcutaneous route could be less bothersome than the intravenous route?

	Yes	No	*P*
Patients (39)	58.97	41.03	0.923
Relatives (38)	57.89	42.11	

Question 9: Would you prefer the subcutaneous route?

	Yes	No	*P*
Patients (39)	35.90	64.10	0.860
Relatives (37)	37.84	62.16	

Question 10: Where indicated, would you like to continue hydration at home?

	Yes	No	*P*
Patients (38)	89.47	10.53	0.234
Relatives (48)	95.83	4.17	

Question 11: Would you prefer the intravenous or the subcutaneous route at home?

	IV	SC	*P*
Patients (32)	81.25	18.75	0.637
Relatives (43)	76.74	23.26	

Question 12: Which route is more complex at home?

	IV	SC	*P*
Patients (29)	65.52	34.48	0.357
Relatives (41)	75.61	24.39	

such as redness, swelling, tenderness, and bruising. Drugs such as diazepam and prochlorperazine, which are irritating, are more likely to cause site reactions and can lead to the formation of sterile abscesses. Absorption of drugs subcutaneously depends on both the type of drug and the volume of solution used. It will also be affected by body habitus, in particularly the volume of subcutaneous fat. This can be a problem for severely cachectic patients. Moreover, subcutaneous blood flow will affect rate of absorption. Other patients who can experience problems include those with lymphedema or severe peripheral edema. Edematous sites should be avoided not only because of poor absorption, but also because of the increased risk of infection.

Intravenous lines are easily managed by nurses and the intravenous catheter is normally inserted to draw blood for laboratory tests, thereby obviating another burden for patients. Other than fluids, a number of drugs can be delivered by the parenteral route. For these reasons, at least in an acute setting with considerable nurse and physician expertise, the intravenous route may offer some advantages. The use of an intravenous line also should consider the attitudes, beliefs, and preferences of both patients and relatives, who substantially attributed a positive meaning to intravenous hydration. In the absence of scientific data regarding hydration guidelines, the knowledge, experience, and influence of health professionals on patients and family members has much to do with the outcome of decisions concerning both artificial hydration and modes of fluid administration.

There are important study limitations to emphasize. Patients were selected by exclusion criteria, were relatively young, and were studied within a specialized palliative care unit for cancer patients. The data cannot be extended to long-term care or nursing homes or non-cancer populations with prevalent elderly. On the other hand, the belief that a treatment was medically indicated could have influenced the opinion regarding the need to hydrate on behalf of relatives and patients. This is a circular argument difficult to resolve.

The perceived benefits of artificial hydration by the caregivers and patients are central to the ethical, emotional, and cultural considerations involved in their decision making. Other than providing information about the potential advantages and disadvantages of any therapeutic choice, patients' wishes and attitudes toward hydration should be explored, also recognizing that caregivers may have concerns. Future research should scientifically establish guidance for the best choice in hydration issues and the best mode to provide fluids, taking into account patients' and relatives' attitudes in different clinical situations, as well as cultural settings.

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