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HEMŞİRELİKTE ARAŞTIRMA GELİŞTİRME DERGİSİ

Determination of Problems of the Patients Depending on Enteral Tube Feeding at Home and Their Interventions for Those Problems

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Original Research

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Abstract

Objective: *The objective of this research is to determine the problems encountered by patients depending on enteral tube feeding at home and the interventions carried out to resolve those problems on a descriptive basis.*

Method: *The research was conducted on adult patients over the age of 18, residing in the province of Ankara - Turkey depending on enteral tube feeding at home for more than three months, and who were registered to a private company rendering home care service. No sampling was adopted in the research and the number of patients taken into the scope of the research was 50. The researcher (first author) of this study was able to observe the patients for a long time thanks to her duty as an "Enteral Nutrition Educator Nurse" working for a private home care service company. The data presented in this study was obtained by following a "one-to-one meeting" method based on questions prepared by experienced researchers in accordance with their experiences on the field and the literature. Number and percentage calculations were used in assessment of the presented data.*

Result: *The average ages of the patients were 69.08 ± 9.25 years. It was determined that nearly all patients had chronic neurological diseases, the consciousness level of 46 % of them was affected at different levels and nearly all of them were partially or totally dependent in their daily life activities. It was determined that the patients were encountering physiological, mechanical and psychosocial problems such as aspiration pneumonia (n=6), tube infection (n=9), vomiting (n=29), constipation (n=22), diarrhea (n=19), tube blockage (n=15), disconnection of enterostomal tube (n=14), and anxiety (n=29). Moreover, patients and their relatives mentioned having financial problems related to material procurement (n=47), non-allocation of health*

service at home (n=40), and patient transportation (n=22).

Conclusion: *Patients fed enterally by tube at home encounter many physiological, psycho-social and economic problems.*

Keywords: *Enteral tube feeding, home care, nursing.*

Evde Enteral Tüple Beslenen Hastaların Yaşadıkları Sorunlar ve Bu Sorunlara Yönelik Yapılan Girişimlerin Belirlenmesi

Özet

Amaç: *Araştırma, evde tüple enteral beslenen hastaların yaşadıkları sorunlar ve bu sorunlara yönelik yapılan girişimlerin belirlenmesi amacıyla tanımlayıcı olarak yapılmıştır.*

Yöntem*: Araştırma evrenini; Ankara il sınırlarında yaşayan, özel bir evde bakım şirketinin kayıt sisteminde bulunup üç aydan uzun süre evde tüple enteral beslenen 18 yaş üstü yetişkin 50 hasta oluşturmuştur. Araştırmada örneklem seçimine gidilmemiştir. Araştırmacı (birinci yazar), sözü geçen özel evde bakım şirketinde "Enteral Beslenme Eğitim Hemşiresi" olarak çalışmış olup araştırma konusu ile ilgili uzun süre gözlem yapmıştır. Araştırma verileri, araştırmacı (birinci yazar) tarafından, araştırmacıların deneyimleri ve literatür doğrultusunda oluşturulan soru formu aracılığıyla, hastaların evlerinde, hasta ya da hastanın yasal vasisiyle yapılan yüz yüze görüşmeler sonucunda toplanmıştır. Verilerin değerlendirilmesinde sayı ve yüzdelik hesapları kullanılmıştır.*

Bulgular: *Hastaların yaş ortalaması; 69.08 ± 9.25' yıldır. Hastaların tamamına yakınının kronik nörolojik bir hastalığı olduğu, % 46'sının bilinç durumlarının çeşitli seviyelerde etkilendiği ve tamamına yakınının günlük yaşam aktivitelerini gerçekleştirmede tamamen ya da kısmen bağımlı oldukları belirlenmiştir. Hastaların, aspirasyon pnömonisi (n=6), tüp giriş yerinde enfeksiyon (n=9), kusma (n=29), konstipasyon (n=22), diyare (n=19), tüp tıkanması (n=15), enterostomal tüpün yerinden çıkması (n=14) ve anksiyete (n=29) gibi fiziksel, mekanik ve psikososyal sorunlar yaşadıkları belirlenmiştir. Ayrıca hasta ve yakınlarının malzeme temin etme (n=47), evde tam kapsamlı sağlık bakım hizmetlerine ulaşma (n=40) ve hasta transferine (n=22) ilişkin olarak da ekonomik sorunları olduğu saptanmıştır.*

Sonuç: *Evde enteral tüple beslenen hastalar fizyolojik, psikososyal ve ekonomik sorunlar yaşamaktadırlar.*

Anahtar Sözcükler: *Enteral tüple beslenme, evde bakım, hemşirelik*

Introduction

During one's lifetime, being healthy both physically and psychologically and maintaining this health is possible through adequate and balanced nutrition.[1] Four basic needs enabling the maintenance of homeostasis are oxygen, foodstuff, excretion of waste products and maintenance of liquid- electrolyte balance. [2] The health status of the individual influences his/her nutrition level to a large extent. Diseases lead to alterations in the amount and kind of food components required. [3] Inadequate or excessive intake of food components in terms of variation and amount is defined as malnutrition. Malnutrition is important in each branch of medicine, it may accompany almost all diseases and has an adverse impact on all kinds of treatment. [4]

It is believed that there is a direct relation between some diseases and development of malnutrition. Among conditions closely associated with malnutrition, cancer, chronic diseases, neurological diseases and advanced age are foremost. In the USA, it has been stated that weight loss at the rate of 50% occurs in cancer patients. [5] It has been reported that in Turkey approximately 40-80% of cancer patients lose weight and 20% die due to the adverse effects of malnutrition rather than

malignity itself. According to the Report on Chronic Diseases (2006) 22 million people suffer from chronic diseases in Turkey. Hypertension, which is the most prevalent chronic disease, accounts for 44% of intracerebral hemorrhagies and leads to neurological problems. Although patients with neurological problems have a prospect of survival, only two third of these people can lead independent lives.

When feeding through natural ways is not possible, enteral or parenteral feeding is carried out depending on the health status of the individual. Enteral feeding has many advantages over parenteral feeding. i.e. being closer to natural feeding, its support of the immune system and the employment of gastrointestinal system and its being cheap and easy to use. [6-8]

According to a data obtained in 2009 in USA, each year 344.000 people from all age groups receive enteral feeding support. In Europe, 35.5% of the patients over the age of 65 receive enteral feeding at home. In the United Kingdom, the number of patients fed with tube at home in 1999 was stated to be 15.000.

In Turkey, there is no official information available regarding the number of patients fed enterally at home. Patients may experience various problems and complications during enteral feeding at home. The most important three complications of enteral feeding are those related to gastrointestinal system (nausea-vomiting, diarrhea, abdominal distension), those associated with feeding tube (dislogged from the body and blockage of the tube and infections at the enterance of the tube) and dehydration. The role of the home care nurse and the enteral nutrition therapy nurses is important in the prevention of these complications, in their detection at the early period and in planning accurate interventions when complications develop and teaching patients and their relatives the correct procedures to be followed associated with enteral feeding. [9,10]

Home care services are required in order that enteral feeding program at home can be safe and efficient. According to recommendations of American Society of Parenteral and Enteral Nutrition (ASPEN) in 2005, enteral feeding is a procedure that should be continued at home in chronic cases, necessitating collaboration between the health care team at the hospital and that at home. Relatives of the patients should be incorporated into the process and a suitable training program should be prepared and offered. It has been stated that the quality of physical environment at home and the availability and accessibility of materials is important for the safe practice of enteral feeding at home. [9,11,12]

Home care decreases possible hospital infections, complications and readmission, prevents unnecessary occupation of hospital beds and reduces cost. [13] Home care services have not been included in the social security framework yet. Home care services in Turkey are conducted by municipalities, as well as by voluntary and private organizations. The organization of these services was regulated by 'The Regulation on the Health Care Services Offered at Home' issued in the Official Gazette published on March 10, 2005. The target population of those cared for at home consists of mostly disabled patients, patients afflicted with severe and chronic diseases and the elderly. The Turkish Ministry of Health has been spending efforts to spread a new pilot practice throughout the country in the framework of 7 health institutions. This practice aims to make it possible to carry out the medical care and rehabilitation of the elderly and patients confined to bed in homes instead of health institutions. In Ankara, the capital of Turkey, training and consultancy services for home care is conducted free by enteral nutrition and

training nurses affiliated with the private sector. Financial support for this service is given by the manufacturer of the nutritional products used by the patients.

According to our observations, patients fed with enteral tube at home in our country are confronted with many problems. Due to the organizational problems in home care services, patients are obliged to go to a hospital or call a physician to the home and pay for his service for procedures requiring the order of the physician such as prescription of drugs, routine blood analysis, renewing the prescription report for a nutritional product or changing the nasogastric tube. Because of the movement restriction of the majority of the patients who need enteral feeding by tube at home, support in patients transfers is needed. The social security instituition covers the expenses of the enteral nutritional products used and no contribution is expected from the patient. However, some problems are encountered when it is required for the State to pay for the materials used for enteral feeding (feeding set, gavage injector etc.), which creates economic problems for the patients and their relatives. As far as we know, there is no previous study in Turkey on the problems experienced by the patients fed by tube at home.

Therefore, need for the determination of the problems experienced by the patients fed enterally by tube at home and of the interventions to solve those problems arose.

The aim of this descriptive study was to determine the problems experienced by patients fed with enteral tube at home and their interventions to solve those problems. It is thought that the findings of this research will contribute to the studies on the development of home care services and home care nursing and to the solution of the problems experienced by the patients fed by enteral tube at home.

Research Questions:

1. What kind of problems do patients depending on enteral tube feeding at home encounter?

2. What are the interventions as for those problems?

Method

Overview of the Research and Sample Selection

The population of the study was comprised of adult patients over the age of 18 residing within the borders of the province of Ankara, fed enterally by tube for longer than three months and registered at a private company offering home care service (Eczacıbası Health Services) (n=80). Patients and their relatives should have gone through a process of experience in order to be aware of the problems. Therefore, patients who had enteral tube feeding at home for a period longer than three months were included in the study. Overall 50 patients were evaluated as during the study 10 patients were admitted to nursing houses, 10 died, 4 were admitted to a hospital, 3 refused to participate in the study and 3 moved outside the city.

Instruments

The data were collected by using questionnaire form prepared based upon the literature and investigator's experience. The mentioned form consisted of three parts. In the first part, there were 11 questions on the demographic characteristics of the patients (sex, age etc), and in the second part there were 10 questions regarding information on enteral feeding (feeding route, feeding method, duration of enteral feeding at home etc.). As to the third part, it included 25 questions on physiological, psychosocial and economic problems encountered during enteral feeding and their attempts to solve these problems (aspiration pneumonia, tube infection, nausea, vomiting, abdominal distension, constipation, diarrhea, tube

clogging, displacement of tube, anxiety, depression, procurement of material etc).

Data Collection and Ethical Aspects of Research

Before data collection, written permission was obtained from the Private Home Care Agency. The questionnaire form was filled out by the investigator using the face-to-face interview method and carried out between July and September 2009. Patients were visited in their homes by the investigator by previous appointment. An informed consent form was signed by the patient or legal conservator of the patient after relevant explanations were made. In the investigation, data on the problems experienced by the patients were obtained primarily from the patients. However, in cases when the patient was unable to express him/herself in oral or written manner, data were obtained from the people who are the primary care givers of the patient.

Data Analysis

Data were analyzed using the SPSS 15.0 (SPSS Inc. Chicago, Illinois) program. In the analysis of data, number and percentage were used. States of consciousness and dependence levels for activities of life were determined according to criteria stated in the literature.

Results

Demographic characteristics of patients are summarized in Table 1.

12.0% (n=6) of the patients developed aspiration pneumonia and they were hospitalized. Nasal tubes of these patients were replaced with an enterostomal feeding such as percutaneous endoscopic gastrostomy (PEG) which represents 67% (n=4) of the patients. 18.0% (n=9) of the patients experienced infection at the entrance of the tube on abdomen (Table 2).

Table 3 contains the distribution of the gastrointestinal system and metabolic problems experienced by the patients as well as the applied interventions. With a rate of 58.0% (n=29) vomiting is the most frequent problem observed in these patients. Keeping the patient's head at a higher position (n=19), consulting a specialist nurse (n=17) and stopping the nutrition (n=16) are the primary interventions to solve the vomiting problem.

The second most frequent gastrointestinal system problem was constipation (n=22), the third was diarrhea (n=39). Of all the patients, only one suffered from dehydration and abdominal distension.

The most frequent mechanical problem encountered was the clogging of the tube (n=15). Irrigating the tube with warm water was among the interventions applied to solve this problem (n=14). The next mechanical problem was the displacement of the enterostomal tube which occurred in 14 patients. The interventions to solve this problem were placing a new tube in a hospital (n=11) and pushing the tube forward (n=2) (Table 4).

The first four psychological problems experienced by the patients were anxiety, crying-weeping, impairment of body perception and self-esteem and disruption of relations with family and friends. In addition to those problems, 47 patients experienced difficulty in procuring materials for enteral feeding at home and 15 patients in provision of suitable physical conditions at home (such as a separate room).

Discussion

This study proves that the majority of the subject patients are fed with the tube enterostomy method. With patients in need of enteral feeding by tube for longer than six weeks the literature re-

Table 1: Characteristics of the Patients (n=50)

Characteristics		n	%
Gender			
Female		31	62.0
Male		19	38.0
Marital Status			
Married		26	52.0
Single		24	48.0
Primary Care Giver			
Daughter		15	30.0
Care Giver		13	26.0
Wife/husband		7	14.0
Son's Wife		6	12.0
Mother		5	10.0
Son		2	4.0
Sister		1	2.0
Himself		1	2.0
Level of consciousness			
Totally Conscious		27	54.0
Lethargic		16	32.0
Stupor		6	12.0
Semi-coma		1	2.0
Dependency Levels of Patients With Daily Living Activities			
Nutrition	Totally dependent	44	88.0
	Partly dependent	6	12.0
	Independent	–	–
Wearing	Totally dependent	41	82.0
	Partly dependent	8	16.0
	Independent	1	2.0
Excretion	Totally dependent	41	82.0
	Partly dependent	5	10.0
	Independent	4	8.0
Movement	Totally dependent	41	82.0
	Partly dependent	8	16.0
	Independent	1	2.0
Taking bath	Totally dependent	46	92.0
	Partly dependent	3	6.0
	Independent	1	2.0
Feeding Path			
Percutaneous endoscopic gastrostomy (PEG)		40	80.0
Nasogastric tube (NG)		7	14.0
Gastrostomy (surgery)		3	6.0
Feeding Type			
Intermittent (by feeding sets)		43	86.0
Continuous		4	8.0
Bolus (by gavage injectors)		3	6.0
The status of training on enteral feeding before discharge			
Yes		14	28.0
No		36	72.0
Mean Age: $\bar{X}$ = 69.08 ± 9.25 years			
The Mean Duration of Enteral Tube Feeding: $\bar{X}$ = 21.78 ± 15.63 Months			

Table 2: Infection Problem and Interventions (n= 50)

Problems	n	Frequency	Interventions *	n
Aspiration Pneumonia (n=6, % 12)	5	1	Taking the patients urgently to hospital	6
			Replacing nasal tube with enterostomal tube	4
	1	2	Withdrawing the nutrition product	1
			Consulting physician due to transeosphagal fistulae	1
Infection at the enterance of the tube (n=9, % 18)	8	1	Changing the tube at hospital	8
			Consulting specialist nurse	2
	1	2	Using antibiotics consulting the physician by phone	1
			Decreasing the amount of nutritional product	1

* More than one answer .

commends tube enterostomy over nasoenteral methods.

Mean duration of enteral feeding of the patients subject to this study was 21.78 ± 15.63 months and almost all these patients were diagnosed with chronic neurological diseases as stated by the literature. [8,14]

Although our study group size is small, it shows that aspiration pneumonia was developed in 12.0% of the patients (Table 2). On the other hand Allison et al (2004) reported that in enteral feeding by tube the incidence of aspiration pneumonia was only 1-4%. However, Attanasio et al (2009) reported that the main complication of nasogastric tube (NGT) versus percutaneous endoscopic gastrostomy (PEG) was the aspiration; 15.5% and 7.9% respectively [4,15]. This study's results are consistent with the literature. Aspiration pneumonia, which is considered as the most serious complication in patients fed enterally by tube, is a problem requiring immediate intervention as it poses vital risks to life. Interventions were consistent with the literature and all the patients were urgently taken to an hospital. After their condition improved, four of the patients underwent the PEG method. Nevertheless, the literature indicates that in case of patients with the risk of aspiration pneumonia, it is better to move the feeding tube in the gastrointestinal system and place it in jejunum. [4,8]

The literature states that in 15% of the patients, local infection develops at the enterance of the inserted PEG and surgery gastrostomy tube. In 18% of the patients included in this study, (n=9) tube infection developed. However, stoma care performed and taught by enteral nutrition therapy nurses may prevent the development of this problem. This study proves that, because of economical difficulties procuring necessary material and tools such as a sterile sponge, even though patients and their relatives receive training on proper stoma care they still can't apply correct interventions as indicated[4].

It is reported that the incidence of metabolic

Table 3: Gastrointestinal System, Metabolic Problems and Interventions (n=50)

Problems	n	Frequency	Interventions*	n
Vomiting (n=29, % 58)	11	1	Keeping the head position at high	19
	6	2	Consulting the specialist nurse	17
	1	3	Withdrawing nutritional product	16
	2	4	Decreasing the amount of product	13
	4	5	Cleaning intraoral area, opening airways	8
	3	10	Postural drainage	4
	2	often	Increasing the amount of fluids	3
			Referring to hospital	2
			Replacing PEG	1
Constipation (n=22, % 44)	1	1	Using laxatives	16
	1	3	Administering enema	12
	2	5	Increasing the amount of liquids	5
	2	10	Increasing movement	4
	16	often	Giving apricot or plum juice or herbal tea	3
			Anorectal stimulation	1
			Decreasing the product	1
Diarrhea (n= 19, % 38)	5	1	Decreasing the amount of product	9
	6	2	Increasing the amount of liquids	8
	1	3	Using antidiarrheal drugs	7
	1	4	Consulting specialist nurse	5
	1	5	Administering the product more slowly	3
	2	7	No intervention	3
	2	10	Diluting the product	2
	1	20	Withdrawing the product	1
			Taking to hospital	1
			Changing product	1
			Initiating anti-diarrhea diet	1
			Stool culture	1
Dehydration (n=1, % 2)	1	1	Infusion support at the hospital	1
Abdominal distension (n=1, % 2)			Consulting specialist nurse	1
	1	4	Decreasing the product	1
			Calling physician to home	1

* More than one answer .

Table 4: Mechanical Problems and Interventions (n=50)

Problems	n	Frequency	Interventions*	n
Tube clogging (n=15, % 30)	3	1	Irrigation with warm water	14
	4	2	Consulting specialist nurse	4
	1	5	Changing tube at hospital	2
	1	7	Stimulating the tube mechanically by hand	1
	1	10	Taking to hospital	1
	2	15		
	3	Often		
Enterostomal tube displacement (n=14, % 28)	11	1	Placing of tube at hospital	11
	1	2	Pushing the disconnected tube forward	2
	1	5	Consulting specialist nurse	2
Nasal tube displacement (n=8, % 16)	3	1	Placing of new tube by relative	4
	1	2	Placing of new tube at the hospital	3
	1	3	Having a new tube placed at home by meeting costs	3
	1	4		
	2	15		

* More than one answer .

complications is lower than the gastrointestinal system and mechanical complications in patients fed enterally. In the scope of this study, dehydration has been reported only in one patient. Findings of the present study are congruent with the ones reported in the literature. In the literature, it is reported that vomiting and diarrhea develop in respectively 20% and 30% of the patients fed enterally. [4,16,17] In the present study, the rates of the development of vomiting (58%) and diarrhea (38%) are quite higher than those reported in the literature. The interventions made by the patients and their relatives to solve those problems are in keeping with the information in the literature. The measures to be taken for the prevention of vomiting and diarrhea are increasing nutrition according to the tolerance of gastrointestinal system, obeying aspiration rules and avoidance of contaminated food. [18,19,20] It is thought that although patients and their relatives receive training on asepsia rules and hygiene during the home care process, economic problems encountered in the provision of materials lead to the feeding set and gavage injectors being used for longer than their normal duration, which may play part in the development of the problem. Constipation is a problem in almost half of the patients (Table 3). It is believed that the high mean age of the patients and their movement restriction play a role in the development of constipation (Table 1). The interventions made by the patients and their relatives for the solution of this problem are suitable. [10,16,21]

It has been reported that mechanical complication occurs at the rate of 2-10% in enteral nutrition.[4,8] Tube displacement and tube clogging are among the common mechanical complications. In the present study, the rates of mechanical complications have been found to be higher than those reported in the literature. In around one third of the patients, (30%) the obstruction of the tube occurred (Table 3). Although there is a lower rate reported in the literature on the occurrence of tube clogging, it is reported that it is the most common of mechanical complications. One of the most important mechanisms underlying the obstruction of the tube is the precipitation of proteins in the feeding solution with gastric acid. Irrigation of the tube with water after food and drug administration and not giving drugs and food concurrently are among the measures that can be taken. Irrigation with warm water is one of the proposed interventions against the blockage of the feeding tube. [8,9,18] It has been established that almost all of the patients and relatives attempted to wash the tube with warm water in order to solve the problem (Table 4).

It has been found that tube displacement is a problem encountered in all patients fed nasogastrically and that five patients experienced this problem more than once. In the literature, Attanasio et al (2009) report that tube displacement of NGT versus PEG was 62.2% and 4.7% respectively. To solve the problem 50.0% (n=4) of the patient relatives inserted the nasogastric tube themselves. [15] Yet, this is a procedure that should be carried out under the supervision of the physician, since complications that may develop during this procedure may threaten the life of the patient. [9,18] All of the patients and their relatives stated that they have difficulty in allotting budget to health services at home. With home health care services becoming more common, it will be posssible to prevent the unnecessary occupation of emergency services for such procedures and death risk incurred by uninformed practices at home. In the study of Girgin et al (2006) on 54 adult patient fed enterally at home, it was established that with follow up and supervision at home, the rate of complications decreased and that enteral feeding can be administered safely at home, hence reducing cost. [20]

It has also been reported that patients fed enterally experience feelings of anger, and guilt and their social life and interpersonal communication is influenced adversely. [22,23] In the present study, it was established that all patients who underwent psychological evaluation (n=29) experienced anxiety. The psychosocial problems encountered by the patients were crying, impairment in body image and self esteem, and disturbance in family-friend relations. In general, interventions to overcome psycho-social problems are family support and pharmacological methods upon the suggestion of the physician. Akat (1995) stated that in the criteria for selection of patients to be fed enterally at home, proper family support plays an important role. [24]

In order to provide proper support to enteral feeding at home, suitable environmental conditions should be met. These conditions can be outlined as suitable physical space (heating, ventilation etc), provision of special beds for patients who need them, and in cases where family cannot support the care of the patients, finding a care giver. [10,14,18,24] However, in the present study, approximately one third of the patients reported that they have difficulties in finding suitable environmental conditions.

Conclusion

In the present study, it was established that patients fed enterally by tube at home experience

such problems as tube infection, aspiration pneumonia, vomiting, constipation, diarrhea, abdominal distension, and the clogging and displacement of tube. In addition, patients stated that they experience psychosocial problems such as anxiety, anger, and alteration of body image and economical problems including having difficulty in the provision of materials (feeding set, gavage injector etc.) and being unable to create conditions at home suitable to home care. In view of these findings, it is our recommendation that health care services and provision of the materials associated with enteral feeding at home should be incorporated into social security insurance, patients and their relatives should be adequately trained in the care of tube and stoma and skin and complications by enterostomal therapy nurse, and that dietician should inform patients on the use of nutritional substances and regular home care services should be provided for these patients.

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