International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 13-05-2020; Accepted: 29-05-2020; Published: 19-06-2020
www.medicalsciencejournal.com
Volume 6; Issue 6; 2020; Page No. 138-141

Comparative study of percutaneous endoscopic gastrostomy and ryles tube feeding tube in neurologically deficit patients

Dhanesh Kumar[1], Bhavya[2*], Abhinav Bansal[3], MK Maheshwari[4]

[1] Associate Professor, Department of Surgery, Subharti Medical College and University, Meerut, Uttar Pradesh, India
[2] Postgraduate resident, Department of Surgery, Subharti Medical College and University, Meerut, Uttar Pradesh, India
[3] Assistant Professor, Department of Surgery, Subharti Medical College and University, Meerut, Uttar Pradesh, India
[4] Professor and Head, Department of Surgery, Subharti Medical College and University, Meerut, Uttar Pradesh, India

Abstract
Neurological deficiency is an economic and physical burden on the patient's family, thus warranting specialized neuro rehabilitation. Nutritional support is an important factor in brain healing and general condition. In our study we compared the results between feeding by ryles tube and percutaneous endoscopic gastrostomy tube. We observed neurological, hematological and biochemical improvement was more in group PEG patients. We concluded that nutritional and neurological improvement was significantly seen in the PEG group of patients, hence, the enteral method of feeding that proved to be better is PEG in neurologically deficit patients.

Keywords: comparative, percutaneous, neurological, economic

1. Introduction

The neurological deficiency is a strain on the patient and the family members attendants physically, mentally, financially as well as socially. The impact of a 'disability' as well as 'dependency' on the patient and the family has a gross impact on the economy with need of specialist care and neuro- rehabilitation along with palliative care. This leads to stress over need of care givers and training for the same urging the need of care methods that are simple and cost effective so as to be carried out in a home setting by family reducing the financial burden. One of the most important aspects of care is the nutritional requirement. Critically ill people are at increased risk of malnutrition. Trauma and inflammation induce stress-related catabolism, and drug-induced adverse effects may reduce appetite or increase nausea and vomiting [1]. Patient management in the intensive care unit (ICU) may also interrupt feeding routines [2, 3, 4]. Methods to deliver nutritional requirements include provision of enteral nutrition, or parenteral nutrition, or a combination of both. However, each method is problematic.

The brain has a remarkable capacity for plasticity. The intrinsic biological variability encountered in the human population can greatly influence the vulnerability of the brain to stress and insults [5]. In particular, dietary factors such as omega-3 fatty acids, can increase production of molecular systems that serve synaptic function, while diets rich in saturated fats do the opposite [6]. The overall evidence indicates that diet and exercise are two noninvasive approaches that can be used to improve molecular mechanisms of neural repair after brain surgery/ trauma, by working through brain-derived neurotrophic factor (BDNF) [7]. Enteral nutrition is considered to be more physiological, economical, restore gastro-intestinal functions early,

Reduces total stay in hospital and reduces the risk of infectious complications as compared to parenteral nutrition in critically ill patients. Other advantages include a reduction in nursing time, lower costs and the absence of a necessary venous catheterization, commonly associated with various complications. Neurogenesis in the brain occurs throughout life, and has been clearly demonstrated at two locations under normal conditions [8, 9]: the subventricular zone (SVZ) of the lateral ventricles and the sub granular zone (SGZ) of the dentate gyrus in the hippocampus. BDNF is a key factor in regulation. The expression levels of BDNF and SGZ neurogenesis are coregulated by both stress and antidepressants (Duman and Monteggia, 2006 [10, 11]. Infusion of BDNF into the dentate gyrus mimics increased neurogenesis. Conditions that induce BDNF expression, such as physical exercise, diet, and enriched environment, also increase SGZ neurogenesis

2. Materials and Methods

- The study was a prospective study of 60 cases of neurological deficit admitted in Subharti Medical College and Hospital, from September 2017 to August 2019 and divided into groups with 30 cases of PEG and Ryles tube feeding. [14].
- Comparison was made in view of nutritional status, complications, recovery and morbidity associated with enteral feed with collection of data prior to procedure and in the follow up period till 3 months.
- Patients with neurological injury with inability to swallow, long life expectancy and informed consent given by attendants were chosen. The tubes were placed and feeding started with close monitoring of the

comparative factors. The PEG tube was placed by pull method in both ICU setups and endoscopy room.

2.1 Inclusion Criteria

- Neurological injury (traumatic or pathological) with inability to swallow
- Comatose patients
- Long life expectancy
- Informed consent given by attendants

2.2 Exclusion Criteria

- Patient with deranged coagulation profile
- Head injury with facial injury and abdominal injury
- Scope of quick recovery
- Short life expectancy
- Nil per oral
- Informed consent not given by attendants

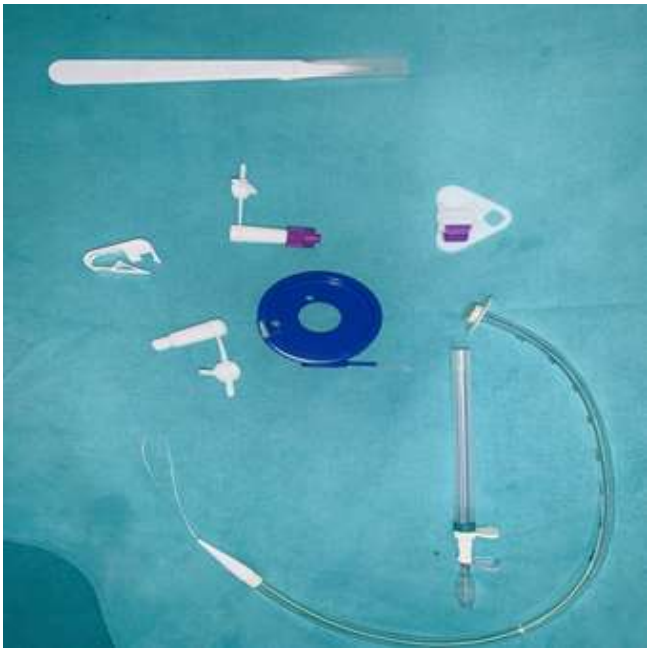

Fig 1: PEG kit: PEG tube, trocar with guide thread, fixators and scalpel in addition to an endoscopy setup, local anesthetic, syringe

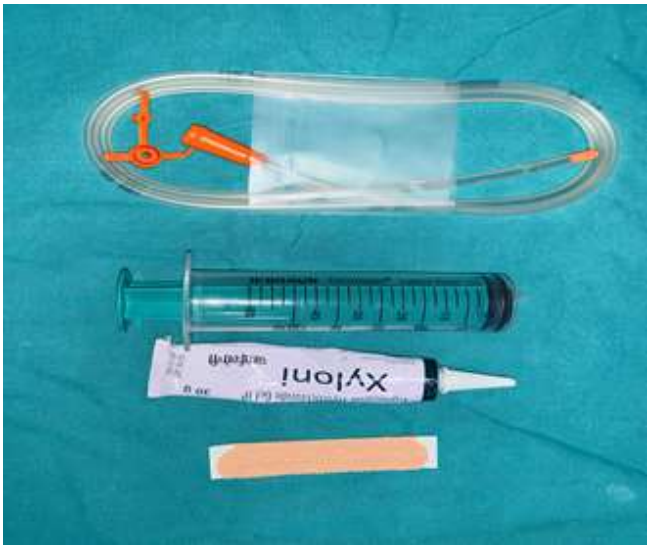

Fig 2: Ryles tube, anesthetic jelly, 50 ml syringe and fixator

Fig 3: PEG feeding in ward by patient's attendant

Fig 4: Ryles tube feeding in ward by patient's attendant

3. Results and Discussion

- Post procedural GCS score was compared to the pre procedural score and the change was tabulated. An increase of >7 was seen in 11 patients of PEG group whereas in only 1 patient RT group. (p: 0.0001, mean 2.90, t = 2.7954, standard error of difference = 0.596)
- Change in haemoglobin was charted in gm/dl in follow up visits and the two groups were compared. An increase of >2 gm was seen in 10 patients of PEG group and 3 patients of RT group (p: 0.0001, mean 2.90, t = 5.0934, standard error of difference = 0.569)
- Serum protein of the patient was charted before feeding was started and in follow up in gm/dl. An increase of more than 1.5 gm was seen in 3 patients of PEG group and none of the RL group (P value equals 0.0300, mean 0.367, t = 2.2242, standard error of difference = 0.165)
- Change in serum Albumin was charted in gm/dl. An increase of more than 1gm was observed in 2 patients each of both groups. (p : 0.0401, mean -0.153, t = 2.1004, standard error of difference = 0.073)
- Change in serum sodium was charted before start of feeding and in follow up in mEq/l. An increase of more than 4mEq/l was seen in 2 patients of RT group and 9 of PEG group (p :0.005, mean 1.23, t = 2.9110, standard error of difference = 0.424)
- Change in serum potassium was charted in mEq/l before feeding and post procedure. An change of >0.4 was observed in 15 patients in PEG group and 5 patients of RT group (p: 0.0476, mean 0.183, t = 2.0241, standard error of difference = 0.091)
- Change in serum calcium was charted before start of feeding and in follow up in mEq/l. An increase of >0.8 was observed in 1 patient of RT group and 11 of PEG group. (p: 0.0053, mean -0.163, t = 2.8990, standard error of difference = 0.056)
- Change in blood urea was noted as a marker of hydration before starting of feeding and in follow up in mg/dl. A decrease of more than 10 was seen in 10 patients of RT group and 20 patients of PEG group.(p: 0.0272, mean 5.37, t = 2.2664, standard error of difference = 2.368)
  Change in serum creatinine was charted in mg/dl. A decrease of more than 0.6 was observed in 1 patient of RT group and 6 patients of PEG group.(p : 0.0293, mean 0.107, t = 2.2344, standard error of difference = 0.048)
- Decrease in TLC was observed in both the group. A decrease of more than 4 x 1000 was observed in 3 and 5 patients of RT and PEG group respectively. (P: 0.0001, mean: 4.387, t = 8.8795, standard error of difference = 0.494)
- Change in the mid arm circumference was charted in cm. An increase of more than 1 cm wad observed in 16 and 17 patients of RT and PEG groups respectively. (P: 0.1619, mean 0.137, t = 1.4167, standard error of difference = 0.096)
- The patients who developed chest infections during the course of treatment after initiation of feeding were charted. 20 patients of RT group were reported to have respiratory infection in comparison to only 5 of the PEG group
- The number of times of the feeding tube changed was charted. 0 change of tube was required in PEG group whereas 22 R tubes were changed at least once
- Episodes of diarrhea were charted in both the groups after initiation of feeding. More than 4 episodes were seen in 6 patients of the RT group and only 1 patient of PEG group. (P: 0.0001, mean: 1.63, t = 5.9649, standard error of difference = 0.274)
- Episodes of fever post initiating of feeding were charted. More than 3 episodes were reported in 9 patients of RT group and none in PEG group.(p: 0.0001, mean: -1.67, t = 6.2399,standard error of difference = 0.267)
- \GOS was estimated after 3 months of initiating feeding. A score of more than 3 was seen in 12 patients of RT group and 22 of PEG group. (P: 0.0004, mean: 0.80, t = 3.7915, standard error of difference = 0.211)
- The total duration of hospital stay were compared in days. 9 patients of RT group stayed beyond the duration of 30 days in comparison of 3 in PEG group. (P: 0.0401, mean:- 4.03, t = 2.1001, standard error of difference = 1.921)
- Blockage of tube was observed and charted between the two groups. 11 tubes in the RT group were blocked and required either a change or de-clotting mechanically.
- A total mortality of 5 patients was observed in RT group and 1 in PEG group

Globally, the burden of neurological disorders, as measured by the absolute number of DALYs, continues to increase. Neurological disorders are the leading cause of disability and the second leading cause of death worldwide. Although age-standardised incidence, mortality, and prevalence rates of many neurological disorders declined for many countries from 1990 to 2015, the absolute number of people affected by, dying, or remaining disabled from neurological disorders over the past 25 years has been increasing globally. Gunnar Elke *et al* 2016 [12]. who evaluated efficiency of enteral versus parenteral nutrition in critically ill patients and concluded that the use enteral as compared to parenteral feed significantly reduced the rate of infectious complications and length of ICU stay. They hence proved that enteral feed should be considered as the first line nutritional therapy in adult neurologically deficit patients with a functioning digestive tract. R H Park *et al* 1992 [13]. performed a randomized comparison on percutaneous endoscopic gastrostomy and nasogastric tube feeding in patients with persisting neurological dysphagia Gastrostomy patients received a significantly greater proportion of their prescribed feed (93% (2%)) compared with the nasogastric group, (55% (4%); p less than 0.001) and also gained significantly more weight after seven days of feeding (1.4 (0.5) kg v 0.6 (0.1) kg; p less than 0.05). Percutaneous endoscopic gastrostomy tube feeding is a safe and effective method of providing long term enteral nutrition to patients with neurological dysphagia and offers important advantages over nasogastric tube feeding.

4. Conclusion

- The neurological, hematological and biochemical improvement was seen more in group PEG patients.
- It can be concluded that nutritional and neurological improvement was significantly seen in the PEG group of patients, hence, the enteral method of feeding that proved to be better is PEG in neurologically deficit patients.
- Early start of PEG feeding should be considered in

neurologically critical patients

References

1. Lewis SR, Schofield-Robinson OJ, Alderson P, Smith AF. Enteral versus parenteral nutrition and enteral versus a combination of enteral and parenteral nutrition for adults in the intensive care unit. Cochrane Database of Systematic Reviews, 2018, (6). Art. No.: CD012276. DOI: 10.1002/14651858.CD012276.pub2.
2. Abdulmeguid AM, Hassan A. Enteral versus parenteral nutrition in mechanically ventilated patients. Neurologia Croatica. 2007; 56:15-24.
3. Abrishami R, Ahmadi A, Abdollahi M, Moosivand A, Khalili H, Najafi A, *et al*. Comparison the inflammatory effects of early supplemental parenteral nutrition plus enteral nutrition versus enteral nutrition alone in critically ill patients. Daru. 2010; 18(2):103-6. [PUBMED: 22615602]
4. Altintas ND, Aydin K, Türkoğlu MA, Abbasoğlu O, Topeli A. Effect of enteral versus parenteral nutrition on outcome of medical patients requiring mechanical ventilation. Nutrition in Clinical Practice: Official Publication of the American Society for Parenteral and Enteral Nutrition. 2011; 26(3):322-9. [PUBMED: 21531737]
5. Kolb B, Gibb R. Brain plasticity and behaviour in the developing brain. J Can Acad Child Adolesc Psychiatry. 2011; 20(4):265-76. PMID: 22114608; PMCID: PMC3222570.
6. Baranauskas G. Pain-induced plasticity in the spinal cord. In: Shaw CA, McEachern J, editors. Toward a Theory of Neuroplasticity. Philadelphia, PA: Psychology Press; 2001, 373-386
7. Lewis PD. Nutrition and anatomical development of the brain. In: van Gelder NM, Butterworth RF, Drujan BD, editors. (Mal)Nutrition and the Infant Brain. New York, NY: Wiley-Liss. 1990, 89-109.
8. Chunmei Zhao, Wei Deng, Fred H Gage. Mechanisms and Functional Implications of Adult Neurogenmesis. Cell. 2008; 132(4):P645-660.
9. Aimone JB. Wiles J. Gage F.H. Potential role for adult neurogenesis in the encoding of time in new memories. Nat. Neurosci. 2006; 9:723-727
10. Alvarez-Buylla A, Lim DA. For the long run: maintaining germinal niches in the adult brain. Neuron. 2004; 41:683-686
11. Lledo PM, Alonso M, Grubb MS. Adult neurogenesis and functional plasticity in neuronal circuits.Nat. Rev. Neurosci. 2006; 7:179-193
12. Gunnar Elke, Arthur RH, van Zanten, Margot Lemieux, Michele McCall, Khursheed N Jeejeebhoy, Matthias Kott, *et al*. Enteral versus parenteral nutrition in critically ill patients: an updated systematic review and meta-analysis of randomized controlled trials. Critical Care. 2016; 20:117
13. Park RH, Allison MC, Lang J, Spence E, Morris AJ, Danesh BJ, *et al*. Randomized comparison of percutaneous endoscopic gastrostomy and nasogastric feeding in patients with persisting neurological dysphagia, BMJ. 1992; 304:1406
14. Dr. Dhanesh Kumar. "Percutaneous Endoscopic Gastrostomy in ICU setting using Portable endoscope." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). 2019; 18(10):29-30.