

Effectiveness of Auscultation and Testing pH for Assessing the Placement of Feeding Tube

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Gastrointestinal conditions affect everyone in life at one time or other. Tube feeding permits maintenance of tissue metabolism and structure even though a patient cannot ingest anything to regain health. Assuring that a tube is in a safe position before its use for feeding is of paramount importance. Nurses have to be extra-cautious to prevent the incidence of such mishaps among the patients. Accurate placement of the distal end of the tube is a skilled procedure. Auscultation is the widely used method to locate the placement of feeding tube once it is introduced in the gastro intestinal tract.

Objectives

The objectives of this study, restricted to selected patients in PS Medical Centre in Kanya-kumari district, were to :

- i) evaluate auscultation as a method of assessing the placement of feeding tube;
- ii) evaluate testing pH as a method of assessing the placement of feeding tube;
- iii) compare auscultation and testing pH in assessing the placement of feeding tube;
- iv) find association between the experiences of the staff who introduced feed-

ing tube and the placement of feeding tube; and
v) analyse the cost effectiveness of auscultation and testing pH in assessing the placement of feeding tube.

For accomplishing the objectives of the study, a comparative and evaluative research approach was considered most appropriate.

The conceptual framework adopted for the study was based on Roy adaptation model which offers guidelines to the nurses' application process and involves 'Assessment, goal, intervention and evaluation'.

Data collection was done from 21-10-2004 to 21-11-2004. The investigator selected 50 subjects for whom tube feeding was indicated by purposive sampling method. The tools used were pH strip, stethoscope and X-ray. The investigator auscultated the epigastric area first and from right lower rib margin to the right midaxillary line to find the placement of distal end of the feeding tube. The whooshing sound heard at epigastric area is considered as gastric placement and increase of sound from right lower rib margin to the right midaxillary line was considered as the intestinal placement of feeding tube. As a second step, the investigator tested the pH of aspirate drawn from the feeding tube. The pH < 5 was considered as the gastric placement and

pH > 6 was considered as the intestinal placement of feeding tube. Moreover, these findings were confirmed under X-ray.

Result and Discussion

X-ray was used as a gold standard to confirm the placement assessed by auscultation and testing pH. Here the investigator as used descriptive and sensitivity and specificity tests. The analysis was applied based on the objectives. The data gathered were analysed by using descriptive and sensitivity and specificity test based on the objectives. The findings are presented below.

Among the subjects chosen for the study by the investigator; 18 per cent fell in the age group of 30-50 years and 82 per cent in the age group of 50-70 years. While considering the sex of the subjects, 56 per cent of the subjects were males and 44 per cent were females. About the diagnosis of the subjects, two per cent of the subjects are with Dandy walker syndrome, two per cent with cerebellar atrophy, two per cent with Guillain Barrie syndrome, four per cent with meningitis and 90 per cent with a diagnosis of stroke. Among the staff that performed the procedure, 68 per cent had 1-2 years of experience, 32 per cent had 3-5 years of experience and 100 per cent of staff were with GNM qualification.

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Evaluation of Auscultation

The findings obtained by auscultation revealed that 96 per cent of subjects had gastric placement of feeding tube and four per cent of subjects had intestinal placement of feeding tube. When it was confirmed with that of X-ray, 90 per cent of gastric placement and four per cent of intestinal placement of feeding tube was correct, whereas six per cent of gastric placement of feeding tube was wrong.

Metheny (2002), McSweeney, Wehrie & Wiersema (1990) also reported that the overall average percentage of correct classification of tube position was 34.4. Several popular nursing textbooks (Black & Matassarin-Jacobs, 1993; Craven & Hirnle, 1992; Monahan, Drake & Neighbours, 1994) list air insufflations and auscultation as the accepted method for checking placement. Kearns & Donna (2001) also found only 45 per cent sensitivity of auscultation for insufflated air.

Evaluation of testing pH

Testing pH revealed that 90 per cent of the subjects have gastric placement and 10 per cent of subjects have intestinal placement of feeding tube, and it is cent per cent correct when confirmed with that of X-ray.

Theodore AC, Frank JA, Ende J, Snider GL, Beer DJ (1984) in their study of evaluating a series of pH values found the sensitivity and specificity to be 0.66 and 0.90. Dobkin (1996) also found the sensitivity and specificity for the pH paper of 100 per cent. Metheny & Williams (2003) also investigated the efficacy of the pH method in predicting feeding tube placement.

Caballero and Heiselman have also investigated the efficacy of the pH method in predicting feeding tube placement.

Comparison of Efficacy of Auscultation and Testing pH

The sensitivity and specificity test has been applied to compare the efficacy of auscultation and testing pH in assessing the placement of feeding tube. For a screening tool to receive a recommendation from first signs, both sensitivity and specificity percentages must exceed 90 percentile. In current study the auscultation has got the sensitivity as 100 per cent and specificity as 40 per cent. The sensitivity of testing pH is cent per cent and the specificity is 100 per cent. Here the sensitivity and specificity of pH is higher than that of auscultation. Thus it is established by this study that testing pH is more reliable and accurate than that of auscultation in assessing the placement of feeding tube.

Metheny (1993) provided more definitive information on the ability of pH to differentiate between gastric and intestinal placement of feeding tubes, by means of using pH method. Many authors have studied the extent to which pH values of aspirates from feeding tubes could be used to differentiate between gastric and intestinal placement. Metheny, Reed & Wiersema (2002) studied the effectiveness of pH measurements in determining feeding tube placement and identified pH as a method to distinguish gastric placement

from intestinal placement.

Association of experience of staff introduced feeding tube and the placement of feeding tube: Fisher's exact test was done to find the association between the experience of the staff and placement of feeding tube. The 'p' value related to the association between the experience of staff and gastric placement of feeding tube is 0.000 which is significant; thus there is a significant relationship between the experience of staff introduced feeding tube and the gastric placement of the feeding tube. The 'p' value of association between the experience of staff and intestinal placement of feeding tube is 0.003 which is significant. Thus there is a significant relationship between the experience of staff who introduced feeding tube and the gastric placement of the feeding tube.

Cost effectiveness of auscultation and testing pH: Auscultation for 50 subjects needed Rs. 225/- and Rs. 4.50 for a single subject. Test pH for 50 subjects needed Rs. 255/- and Rs. 5.10 for a single subject. Thus the expenditure incurred for auscultation is less than that of testing pH. The extra expenditure of small amount of 60 paise per subject shall be ratified as accuracy of the procedure cannot be risked for thrift this negligible extra cost. Hence testing pH is preferred. In this study the sensitivity and specificity of auscultation was 100 per cent and 40 per cent; and the sensitivity and specificity of testing pH was cent percent. This shows that the testing pH was a more reliable and effective

tive method than auscultation.

Conclusion

Testing pH has got the sensitivity and the specificity more than auscultation; thus testing pH is a more reliable and effective method than auscultation. It is emphasised that testing pH can also be performed in hospitals to assess the placement of feeding tube irrespective of age group of patients.

Recommendations

- ◆ The study can be done of large number of samples.
- ◆ The same study can be conducted to determine the various factors affecting the placement of feeding tube.
- ◆ The research can be conducted in subjects with same diagnosis and same age group.
- ◆ The study can be done to compare the pH variations among the patients with H₂ receptor antagonist and patients without

H₂ receptor antagonist.

- ◆ Since pH papers available with various trade marks, the difference in result with various pH papers with different trade marks may be studied.
- ◆ pH sensor method and pH paper method may be studied to determine the greater efficacy between these two methods in assessing the placement of feeding tube,
- ◆ The study can be conducted to assess the complications that can occur in patients with nasogastric feeding tube.
- ◆ This study can be done on patients who require tube feeding for longer periods.
- ◆ The further study can be done to assess the effectiveness of STP of feeding tube insertion for the purpose of preparing module on the same for daily use.

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Election Results: TNAI Mizoram State Branch

The elections of TNAI Mizoram State Branch were held on 18 February 2009, between 10 am to 1 pm at Vanapa Hall, Aizawl during the 14th Biennial Conference. The following Office Bearers were elected:

President: Ms Ramfangzaui, Nursing Superintendent, Presbyterian Hospital, Durtlang

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Jt. Secretary: Ms T. Rozami, Tutor, Mizoram College of Nursing, Aizawl

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Finance Secretary: Ms Lalbiaknii, Nursing Superintendent (Rtd), Aizawl

SNA Advisor: Ms R. Lalchhanhimi, Vice-Principal, Presbyterian Hospital, Durtlang

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Chairperson, Membership Committee: Ms F. Biakzaui, Tutor, Nursing School, Presbyterian Hospital, Durtlang

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Chairperson, Nursing Service Section: Ms Rothangpuii Sailo, Asst. Director Nursing, Mizoram

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Chairperson, Socio-Economic Welfare Committee: Ms Rothansiami, Ward Superintendent, H/W Trg. School, Aizawl

Representative of ANM/HW: Ms Lalduhawmi, H/W, Venghnuai Subcentre

Mrs. Lalchhanhimi, Returning Officer

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