

National Survey of Total Parenteral Nutrition Practice in Saudi Arabia: Drug Monitoring and Patient Education at MOH Hospitals

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Abstract

The National Survey of Total Parenteral Nutrition practices with emphasis on TPN drug monitoring and patient education at MOH hospital conducted in Saudi Arabia. To explore the TPN current practice with focusing on TPN monitoring and patient education Twenty-four hospitals received the survey with twenty hospitals responded 80.33% response rate. Of that 45% of the hospitals not documented TPN medications errors, 55% of the hospital not reported TPN adverse reaction. More than 50% of hospitals the drug quality reporting system not existed and more 95% of the hospital does not do ISMP self-assessment of medication safety. The TPN staff competency is done in 80% of the hospital while pharmacy staff job satisfaction not done at 40% of the hospitals. TPN education program for patients not existed in 75% of the hospitals, 95% of the hospital does not apply patient satisfaction, and only 20% of the hospitals participated at world nutrition days. TPN utilization evaluation not presented in 90% of hospitals, 90% of the hospitals does not apply for TPN Pharmacogenomics programs and 100% of the hospitals do not do any researches. The survey explored the real TPN practice of monitoring and patient education Targeting of implementing international standard TPN Practice on Monitoring and patient education lead to preventing TPN-related problems, improve TPN training and education, raise patient satisfaction of TPN services to reach TPN patient outcome, and prevent burden cost on health care system.

Keywords: Parenteral Nutrition; Drug monitoring; Patient counseling; Ministry of Health; Saudi Arabia

Abbreviations: TPNS: Total parenteral nutrition services; ASPEN: American Society of Parenteral and Enteral Nutrition; ISMP: Institution of Safe Medication Practice; GAPC: General Administration of Pharmaceutical care; MOH: Ministry of Health; ASHP: American society of health system pharmacist; SPS: Saudi Pharmaceutical Society

Introduction

The total parenteral nutrition (TPN) distribution procedures system consisted of procurement, prescribing, transcribing, preparation and dispensing. Thus, ending with very two important steps TPN monitor and patient education and counseling. That a final step affects all previous works; if not done properly. A joint commission of hospital accreditation standard and Saudi center of health care accreditation made the separate chapter on medication management and used (MMU) [1-2]. They stated the final step of medication processes was medication monitoring, follow-up and patient education. That is including drug-related problems after reach to the patient with another name her TPN-related challenges and complications. It consisted of TPN medication errors, TPN adverse reaction, TPN quality manufacturing products and patient education with counseling related issues [1-2].

In the world, the idea behind founded Intravenous (IV) admixture and TPN preparation is exposure to fatal errors. Several reports from medication safety organization; American Society of Parenteral and Enteral Nutrition (ASPEN) and Institution of Safe Medication Practice (ISMP) issued TPN-related errors cases and led potential to death, especially in pediatrics population [3-7]. Some international literature

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said that stage of transcribing (39%), preparation (24%) and administration (35%) with a high percentage of errors among stages of TPN distribution [8]. Moreover, with a high rate of TPN errors ISMP considered it as one of the high-risk medication, all health care organizations should set up preventive measures and avoid all factors contributing to TPN-related mistakes. ISMP recommended making self-assessment of medication safety at hospitals [9]. ASPEN and ASHP advised to follow up safety guidelines in all stages of TPN distribution system [5-10]. General Administration of Pharmaceutical Care (GAPC) established national medication safety program to prevent drug misadventures. It required to follow up and documentation of medication errors, adverse drug reaction, drug quality problems. That's including all medications and TPN among them [11-13].

The adherence to those guidelines varies from 15-80% depending on each safety steps and procedure [14]. ASHP did hospital pharmacy practice general in the USA including little information of TPN practice [15-17]. Also, ASHP collaborated with Saudi Pharmaceutical Society (SPS) did the same hospital pharmacy survey in Riyadh City, Saudi Arabia only [18-20]. Their publication had very few information about TPN practices in Saudi and did not include TPN monitoring and patient education per say in the study. In Saudi, the authors not familiar with any studies to investigate what's the real situation and exploring of TPN practice with emphasis to TPN monitoring and patient counseling? It is even not available at Gulf or Middle East countries it very hard to find them. The authors do a survey of TPN practice at MOH hospitals with emphasis to TPN monitoring and patient education as part of TPN distribution system stages. The goal of this study to examine TPN practices with emphasis of TPN monitoring and patient counseling.

Methods

The survey is the third segment of the national survey of Total Parenteral Nutrition at MOH hospitals; Drug monitoring and patient education. It consisted of part of 50 questions designed by the authors. The survey based on American Parenteral and Enteral Nutrition standard and guidelines (ASPEN), American Society of Health-System Pharmacists (ASHP) and current literature. It included the following but not limited to; TPN Practice Management, Managing the TPN-Use Process, Total Parenteral Nutrition Patient Care, TPN Material Procurement and Inventory Management, Total Parenteral Nutrition (TPN) Delivery, Evaluating the Effectiveness the TPN-use System, Total Parenteral Nutrition (TPN) Research.

The survey distributed to twenty-four hospitals had a Total parenteral nutrition services (TPNS) of MOH Hospital located in several regions. In 2014; The study conducted in 2014. The survey distributed to TPNS supervisors. The authors followed up by telephone and emails after two weeks. By the end of four weeks, the final surveys collected. The survey data information entered into Microsoft Excell version 10 for analysis. In this study, the second segment; Drug monitoring and patient education explored and analyzed.

Results

The survey distributed to twenty-four hospitals, twenty hospitals responded, the response rate was 20 (80%). As showed in Table 1; 65% large hospitals, 20% medium size hospitals and 15% medical cities. In TPN medication safety; 45% of the hospitals not documented TPN medications errors, 55% of the hospital not reported TPN adverse reaction. More than 50% of hospitals the drug quality reporting system not existed and more 95% of the hospital does not do ISMP self-assessment of medication safety in TPN services as showed in Table 2. The TPN staff competency is done in 80 % of the hospital while pharmacy staff job satisfaction not done at 40% of the hospitals in TPN services as showed in Table 3. In TPN education program for patients, 75% of the hospitals not existed, 95% of the hospital does not apply patient satisfaction about TPN services and only 20 % of the hospitals participated at world nutrition days as explored in Table 4. In TPN utilization and researchers, the authors found that is TPN utilization evaluation in 90% of hospitals not existed, 90% of the hospitals does not apply for TPN Pharmacogenomics programs and 100% of the hospitals do not do any researches as showed in Table 5. In the TPN services reporting and evaluation the authors found that is only 40% of hospital done TPN monthly reporting system while 60% of the hospital evaluate the TPN services annually as showed in Table 6.

Discussions

In Saudi Arabia, this is the first study about TPN services at MOH hospitals with the third stage of TPN monitoring and patient educations. It discussed crucial elements in TPN distribution process. Starting from TPN monitoring related issues; besides to patient TPN edu-

cation. In TPN medication safety; the authors found the number of hospitals reported TPN adverse drug reaction less than what found in Alsultan *et al.* study. The other issues related to medication safety not mentioned in the same study [20]. Most of the pharmacists excepted should report a regular medication, not TPN, also, medication safety new started at MOH hospitals in 2013, its need more awareness to improve reporting system. The remaining of TPN safety things for current medication errors, drug quality notification system and ISMP self-assessment of hospitals medication safety did not report in any previous study as part of TPN services practice. The TPN staff competency did at an acceptable level. It is hard to find the local study to investigate the extent of general pharmacy competencies or even in TPN competencies. There are few studies examined the competencies related to using metered dose inhaler in Saudi while another study investigated competency of pharmacy research in Qatar [21-22]. In TPN staff job satisfaction; the authors found little results less than what should require from Joint Commission organization [1]. There is no international, or local study examined the extent application of pharmacist job satisfaction and TPN utilization evaluation, although both used as a pharmacy indicator of pharmacy strategic plan. However; there are few studies in Saudi Arabia conducted to measure the level of pharmacy job stratification with the different section of pharmacy practice workforce including job satisfaction in community pharmacy, job satisfaction in the hospital and primary care centers [23-24]. Both TPN staff job satisfaction and TPN competency required for pharmacy strategic plan in Saudi Arabia [11].

In TPN education program for patients, the author found TPN education program application at MOH hospital less than Saudi study by Alsultan *et al.* [20]. This result is normal finding due to a new concept of patient education program at MOH hospitals. Just last year in 2015, GAPC started patient medication education program including nutrition support pharmacy. Inpatient satisfaction on TPN services; there is no study discussed this matter related TPN, most of the studies conducted community pharmacy worldwide with few studies as the hospital. Also, only four studies done in Saudi and Gulf counties, all of them carried out with community pharmacy or ambulatory care visitors at an outpatient pharmacy, there is not yet published for inpatient [25-28]. The number hospitals participated at world nutrition days tiny. This typical finding because the GAPC based on strategic planning, they started pharmacy public health since 2013 with focusing on the chronic diseases world diabetic day, world Asthma day, world psychiatric day, and world pharmacist day. Maybe in the future, we see more participation on global nutrition days.

In TPN utilization and researchers, the authors found that is TPN utilization evaluation program at hospitals much less than found in the study by Alsultan *et al.* [18], Medication usage evaluation is not activated at MOH hospitals including TPN services. Also, TPN Pharmacoeconomics program did not exist; this finding is normal because it not applied on a grand scale at all MOH hospitals and even for each pharmacy practice or clinical pharmacy specialties. It may be the most application in the process of addition new medication to MOH formulary (drug evaluation processes); it is a part of the national drug information program. Moreover, it used as a part of the drug utilization evaluation program [29-31]. The TPN researchers did not exist yet; maybe this reports the first study done in the TPN field. However, both of these elements included as a part of pharmacy strategic planning [11]. In the TPN services reporting and evaluation; the authors found small percentages. It is okay to find this result; however the general pharmacy planning is required to follow up based on pharmacy indication, just recently apply them, the author hope next report may be the percentage increases [11].

Limitations

Despite the survey is the unique in Saudi Arabia and Gulf countries and it maybe around the world, as a national study of TPN practice with emphasis on TPN monitoring and patient counseling, it reflected the real TPN practice contained strengths points and weakness elements and this the best available resources currently. However, it had some limitations including but not limited to the following, the study with a small number of hospitals; it did not include non-MOH hospitals or privates sectors. In addition to there is no full or complete information about TPN monitoring and patient counseling.

Conclusion

This survey explored the gap analysis between the real practice and our strategic goals and objectives in TPN safety preventive measures, TPN staff competency, TPN utilization evaluation and TPN pharmaco economics related issues and TPN research field. Targeting to resolve those changeless and the discrepancies with regular survey follow up every year; it improve TPN services with emphasis on monitoring patients on TPN, prevent TPN-related problems and complications and raise TPN patient satisfaction.

Region	Number of hospitals	Percentages %
Hospital size (Number of staffed beds)		
Small		
<50	0	0%
50–99	0	0%
Medium		
100–199	0	0%
200–299	4	20%
Large		
300–399	4	20%
400–599	9	45%
More that or equal 600	0	0%
Very Large		
Medical Cities	3	15 %
Missing No-Response	4	20 %
Ownership		
MOH-Hospitals	20	100%
Non-MOH Hospitals	0	0%
Privates	0	0%
Accreditation		
CIBAHI	20	100%
JCI	5	25%
Canada	0	0%

Table 1: Size, Ownership and Accreditation of Respondents.

Region	Small <100 n (%)	Medium 100–299 n (%)	Large 300–399 n (%)	Large 400- > or = 600 n (%)	Medical Cities n (%)	Total n (%)
TPN Medication errors report (hospitals n=20)						
Less than 3 months	0 (0)	1 (5)	1 (5)	4 (20)	2 (10)	8 (40)
Every 3 months	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Every 6 months	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Every 12 months	0 (0)	0 (0)	0 (0)	3 (15)	0 (0)	3 (15)
Not reporting	0 (0)	3 (15)	3 (15)	2 (10)	1 (5)	9 (45)
TPN ADR report present (hospi- tals n=20)						
Less than 3 months	0 (0)	1 (5)	0 (0)	2 (10)	2 (10)	5 (25)
Every 3 months	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Every 6 months	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
Every 12 months	0 (0)	0 (0)	0 (0)	3 (15)	0 (0)	3 (15)

Not reporting	0 (0)	3 (15)	4 (20)	3 (15)	1 (5)	11 (55)
TPN Drug quality report system present (hospitals n=20)						
Less than 3 months	0 (0)	1 (5)	1 (5)	2 (10)	2 (10)	6 (30)
Every 3 months	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Every 6 months	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Every 12 months	0 (0)	0 (0)	0 (0)	2 (10)	0 (0)	2 (10)
Not reporting	0 (0)	3 (15)	3 (15)	5 (25)	1 (5)	12 (60)
Annual scores ISMP assesment in TPN ((hospitals n=19)						
100%	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
75%	0 (0)	0 (0)	0 (0)	2 (10)	0 (0)	0 (0)
50%	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
25%	0 (0)	1 (5.26)	0 (0)	0 (0)	0 (0)	1 (5.26)
Not done	0 (0)	3 (15.78)	4 (21.04)	6 (31.56)	3 (15.78)	18 (97.74)

Table 2: TPN Medication Safety.

Region	Small 100 n (%)	Medium 100-299 n (%)	Large 300-399 n (%)	Large 400- > or = 600 n (%)	Medical Cities n (%)	Total n (%)
Pharmacist and Pharmacy Technition TPN Competancy (hospitals n=20)						
100 % Pharmacist and Pharmacy Technition	0 (0)	3 (15)	1 (5)	5 (25)	3 (15)	12 (60)
75 % Pharmacist and Pharmacy Technition	0 (0)	1 (5)	1 (5)	2 (10)	0 (0)	4 (20)
50 % Pharmacist and Pharmacy Technition	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
25 % Pharmacist and Pharmacy Technition	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
0 % Pharmacist and Pharmacy Technition	0 (0)	0 (0)	2 (10)	1 (5)	0 (0)	3 (15)
TPN Pharmacist and Pharmacy Technition job satisfaction (hospitals n=20)						
100 % Pharmacist and Pharmacy Technition	0 (0)	1 (5)	0 (0)	5 (25)	2 (10)	8 (40)
75 % Pharmacist and Pharmacy Technition	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	1 (5)
50 % Pharmacist and Pharmacy Technition	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
25 % Pharmacist and Pharmacy Technition	0 (0)	0 (0)	2 (10)	0 (0)	0 (0)	2 (10)
100 % Pharmacist and Pharmacy Technition	0 (0)	2 (10)	2 (10)	3 (15)	1 (5)	8(40)

Table 3: TPN Staff Competancy and Satisfaction.

Region	Small <100 n (%)	Medium 100-299 n (%)	Large 300-399 n (%)	Large 400- > or = 600 n (%)	Medical Cities n (%)	Total n (%)
TPN services Patient Counselling (hospitals n=20)						
100% of TPN patients	0 (0)	0 (0)	0 (0)	2 (10)	1 (5)	3 (15)
75% of TPN patients	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	1 (5)

50% of TPN patients	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
25% of TPN patients	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
0% of TPN patients	0 (0)	4 (20)	4 (20)	6 (30)	1 (5)	15 (75)
TPN services Patient satisfaction every six months (hospitals n=20)						
100% of TPN Services	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
75% of TPN Services	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
50% of TPN Services	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
25% of TPN Services	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
0% of TPN Services	0 (0)	4 (20)	4 (20)	8 (40)	3 (15)	19 (95)
The pharmacist participate International World TPN Day (hospitals n=20)						
100 % participation	0 (0)	1 (5)	0 (0)	1 (5)	3 (15)	5 (15)
75 % participation	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	1 (5)
50 % participation	0 (0)	0 (0)	1 (5)	2 (10)	0 (0)	3 (15)
25 % participation	0 (0)	0 (0)	1 (5)	2 (10)	0 (0)	3 (15)
0 % participation	0 (0)	2 (10)	2 (10)	4 (20)	0 (0)	8 (40)

Table 4: TPN Patient Education and Consultation.

Region	Small <100 n (%)	Medium 100-299 n (%)	Large 300-399 n (%)	Large 400- > or =600 n (%)	Medical Cities n (%)	Total n (%)
Total Parenteral Nutrition Utilization Evaluation (hospitals n=20)						
100 % of TPN Prescriptions	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
75 % of TPN Prescriptions	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
50 % of TPN Prescriptions	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	1 (5)
25 % of TPN Prescriptions	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
0 % of TPN Prescriptions	0 (0)	4 (20)	4 (20)	8 (40)	2 (10)	18 (90)
TPN services Pharmacoeconomics program (hospitals n=20)						
100% of TPN patients	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	1 (5)
75% of TPN patients	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)	1 (5)
50% of TPN patients	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
25% of TPN patients	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
0% of TPN patients	0 (0)	4 (20)	4 (20)	9 (45)	1 (5)	18 (90)
TPN services Researches (hospitals n=20)						
100% of TPN Services	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
75% of TPN Services	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
50% of TPN Services	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

25% of TPN Services	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
0% of TPN Services	0 (0)	4 (20)	4 (20)	9 (45)	3 (15)	20 (100)

Table 5: TPN Utilization Evaluation and Research.

Region	Small <100 n (%)	Medium 100-299 n (%)	Large 300-399 n (%)	Large 400- > or = 600 n (%)	Medical Cities n (%)	Total n (%)
Theres TPN Services Monthly Stastical reports (hos- pitals n=20)						
100% of TPN reports done	0 (0)	1 (5)	1 (5)	4 (20)	2 (10)	8 (40)
75% of TPN reports done	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
50% of TPN reports done	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
25% of TPN reports done	0 (0)	2 (10)	1 (5)	1 (5)	0 (0)	4 (20)
0% of TPN reports done	0 (0)	1 (5)	2 (10)	2 (10)	1 (5)	6 (30)
TPN services Annual Evaluation (hospitals n=20)						
100% of TPN Services	0 (0)	3 (15)	1 (5)	5 (25)	3 (15)	12 (60)
75% of TPN Services	0 (0)	0 (0)	0 (0)	1 (5)	0 (0)	1 (5)
50% of TPN Services	0 (0)	0 (0)	1 (5)	1 (5)	0 (0)	2 (10)
25% of TPN Services	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
0% of TPN Services	0 (0)	1 (5)	2 (10)	2 (10)	0 (0)	5 (25)

Table 6: TPN Follow up Evaluation.

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