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Original Research Article

A Study to Access the Knowledge and Practices of Homeopathy Practitioners Regarding Intravenous Fluids in Tertiary Care Hospital

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Abstract:

Introduction: Intravenous (IV) fluid therapy is pivotal in medical care, yet inadequacies in its administration have been linked to increased complications and adverse outcomes. Despite the significance of fluid management, there's a notable lack of integrated practical guidelines for junior doctors, leading to common errors in prescribing and administering IV fluids. This deficiency extends to both adult and pediatric care, posing substantial risks to patients, especially in the context of electrolyte imbalances and inappropriate fluid choices. Recognizing these concerns, this study aimed to assess the knowledge, attitudes, and practices regarding IV fluid therapy among B.H.M.S practitioners practicing allopathy in the Pune region.

Methodology: A prospective, cross-sectional survey employing a structured, validated questionnaire comprising 17 multiple-choice questions was conducted among 50 B.H.M.S practitioners practicing allopathy. Participants were enrolled through purposive sampling and were required to provide written informed consent. Statistical analysis of the collected data was performed using standard software.

Results: Among the 50 participating practitioners (60% male, 40% female), most had extensive practice experience exceeding 30 years. However, when assessing knowledge about IV fluids, a considerable knowledge deficit was evident. For instance, only a small percentage correctly identified the most physiologically adaptable fluid and had clarity on drug dilution in specific solutions. While awareness about complications associated with IV site issues was relatively higher, understanding regarding conditions where certain IV fluids should be avoided was notably inadequate. Notably, all practitioners unanimously agreed on the need to emphasize clinical IV fluid knowledge during training.

Discussion: The study highlighted significant knowledge gaps among B.H.M.S practitioners concerning IV fluid therapy, aligning with findings from similar studies involving different medical cohorts. Issues pertaining to drug dilution, appropriate fluid choices based on conditions, and understanding the most suitable IV fluids revealed substantial deficiencies. Addressing these gaps through enhanced teaching and training methodologies is imperative to improve clinical practice.

Conclusion: The study underscores a pressing need for additional training modules addressing IV fluid therapy among B.H.M.S practitioners before their practice in allopathy. The observed knowledge deficits emphasize the necessity for comprehensive educational interventions to enhance competence and confidence in IV fluid prescription and administration.

Keywords: Intravenous fluid therapy, B.H.M.S practitioners, Allopathy, Knowledge gaps, Clinical practice, Training modules, Pune region.

Introduction

Intravenous (IV) fluid therapy is fundamental in surgical care. Poor IV therapy has been associated with increased complications. Fluid assessment, prescription and administration are essential daily tasks on most medical and surgical wards [1]. These are complex responsibilities that entail careful clinical and biochemical assessment, good understanding of the principles of fluid physiology in health and disease, and appropriate supervision and training. Unfortunately, problems of both under and over hydration are common and many senior clinicians are aware that there is significant morbidity and mortality associated with inappropriate fluid management in hospitals. [2]

Although most medical schools address the physiological principles of fluid homeostasis in their undergraduate curricula, these are rarely integrated into practical clinical guidelines to inform fluid prescription by junior doctors in clinical settings. The purpose of intravenous fluid therapy (IFT) is to maintain or restore internal

equilibrium by administering fluids and/or different electrolyte components. Its correct use and the prevention of complications arising from their misuse depend on the knowledge of the medical team on this subject [3].

Fluid balance is a term used to describe the balance of the input and output of fluids in the body to allow metabolic processes to function correctly. (Welch, 2010). Around 52% of total body weight in women and 60% in men is fluid. This consists of water and molecules containing, for example, sodium, chloride and potassium (mooney, 2007). These compounds dissociate into particles which carry electrical charge; these particles in solutions are called electrolytes. Plasma electrolytes are balanced as it is important to have the correct.

Whether IV fluid therapy is needed for fluid resuscitation, maintenance, replacement or redistribution, it is vital that the choice, volume and timing of IV fluids are correct. Different types of fluids are appropriate for different situations [3]. Errors in prescribing or administering IV fluids can result in inadequate or excessive provision. Despite the relative complexity of estimating a patient's IV fluid needs, assessment and prescription is often delegated to healthcare professionals who have received little or no specific training on the subject [4-5]. Prescribers are not always aware of the most appropriate type and volume of IV fluids to use for specific conditions. Additionally, many healthcare professionals may be unaware of the specific physiological changes associated with these conditions in adults. In the past there has been little formal training and education in IV fluid management to support corrects prescribing. Furthermore, failing to correct imbalances in electrolytes can lead to disturbances in intracellular or extracellular electrolyte balance in adults, particularly in those with reduced liver or kidney function. Failing to deliver adequate fluid replacement can therefore have a significant impact upon morbidity and mortality.

As far as children is concerned A National Patient Safety Agency alert[31] has highlighted safety concerns in relation to the use of hypotonic IV fluids in children, as these fluids are associated with the development of hyponatremia. Children are more at risk of developing brain swelling and neurological complications because of hyponatremia compared to adults.

There are many cases in the literature where children have died because of inappropriate hypotonic fluid therapy. Monitoring and assessment of children receiving IV fluids is of paramount importance to guide continuing therapy however, this is often difficult and challenging for healthcare professionals. In addition, blood tests required to assess, and guide IV fluid therapy can be painful and distressing for the child, and difficult to repeat. As a result, assessment and monitoring is often suboptimal, with fluid and electrolyte status not being evaluated adequately. This may lead to inappropriate IV fluid prescribing.

The aim of this NICE guideline is to help prescribers understand the:

- indications for IV fluid therapy
- reasons for the choice of the various fluids available
- prevention and treatment of sodium imbalance
- principles of assessing fluid balance
- Training and education needs of those prescribing IV fluids.

This guidance represents a major opportunity to improve the safety of children receiving IV fluid therapy in hospital. It applies to babies born at term, babies born prematurely whose corrected age is term or more, infants, children and young people up to 16 years. The guideline covers the general principles for managing IV fluids and applies to a range of conditions and different settings. It does not include specialized fluid prescribing needs such as those relating to specific conditions.

The assessment, prescription and administration of intravenous fluids in children are complex responsibilities involving clinical and biochemical assessment and a good understanding of the principles of fluid physiology. Healthcare professionals involved require appropriate training and education to ensure that morbidity and mortality is minimized.

'Intravenous fluid therapy in adults in hospital' (NICE guideline CG174) outlined 4 issues relating to failures in education and training which contribute to poor fluid management, and these would equally apply to a paediatric setting:

1. Poor understanding of the basic principles of fluid balance and a lack of knowledge about fluid management.
2. Poor fluid balance (chart) documentation.
3. Poor interpretation of laboratory results.
4. Inadequate involvement of senior clinicians in fluid management and delegation of fluid prescription to junior members of the team.

Materials & Methods

This prospective, cross-sectional, questionnaire based study was conducted in homeopathy practitioners of either gender in Pune region. Approval from institutional ethics committee was taken. This was a descriptive questionnaire-based cross-sectional study (survey) that was carried out inB.H.M.S practitionersbut practicing allopathy. A sample size of 50(50 Doctors) was enrolled by purposive sampling method. After explaining about the nature and purpose of the study, a written

informed consent was taken from the participants and a validated questionnaire containing 17 questions was filled by these B.H.M.S practitioners. They were interviewed using structured, validated questionnaire of 17 multiple choice questions to obtain information about knowledge and practice regarding use of intravenous fluids. The data was analyzed and presented as percentages of total responses. Thus, data for knowledge attitude and practice of intravenous fluids was collected from these B.H.M.S practitioners.

Questionnaire consisted of multiple response type questions. Questionnaire was prepared only in English. About IV fluids prescriptions we assessed attitudes towards prescribing practices (physician-related) and preferences among B.H.M.S practitioners. The data was recorded and analyzed using standard statistical software.

Inclusion Criteria-

1. B.H.M.S practitioners but practicing allopathy in Pune region.
2. Participants who was willing to participate study or answer the questionnaire

Exclusion Criteria-

1. Physician who was not willing to participate, or answer the questionnaire.
2. Physicians who was belonging to other pathies (M.D./ M.S., MBBS, B.A.M.S).
3. B.H.M.S practitioners who was not practicing allopathy.

Statistical Analysis:

The data in study was recorded and analyzed using standard statistical software.

Results

The standard validated questionnaire was answered by 50 general practitioners. Amongst the total 50 practitioners, 20 were female practitioners (40%) and 30 were male practitioners (60%)(Figure-1). Most of the physicians in the study group were senior practitioners with a practice experience of more than 30 years (68%) whereas only 32% of physicians were having practice experience of less than 30 years (Figure-2). When the knowledge was evaluated about use of IV fluids, only 18% of homeopathy practitioners had knowledge about most physiologically adaptable fluid (0.9% NS)(Figure-3). when the knowledge about drug dilution was checked 70% and 28 % were not aware which drugs should be diluted strictly in 5% dextrose and normal saline solution respectively, to obtain therapeutic effect (Figure- 4).On the contrary, 62% practitioners (Figure-6)were knowing about the complication at iv site, but only 30% practitioners were knowing colloidal plasma expanders should not be used in renal insufficiency whereas 70% were not knowing the conditions where colloidal plasma expanders should not be used.(Figure-7). In the study it was seen that when asked about how many drops of intravenous fluid will constitute one mililitre,58% were given correct answer.(Figure-7). During the study it was observed that none of the practitioners were aware that which of the best non-invasive method to monitor restoration of blood volume after starting intravenous fluids.(Figur.-8). During the study when asked about which intravenous fluid does interferes with grouping and cross matching, only 24% practitioners were given correct answer.(Figure-9) .Interestingly when asked about that Do you think intravenous fluid knowledge(clinical) needs to be emphasized in internship as a part of training,100% practitioners were agreed.(figure-10)

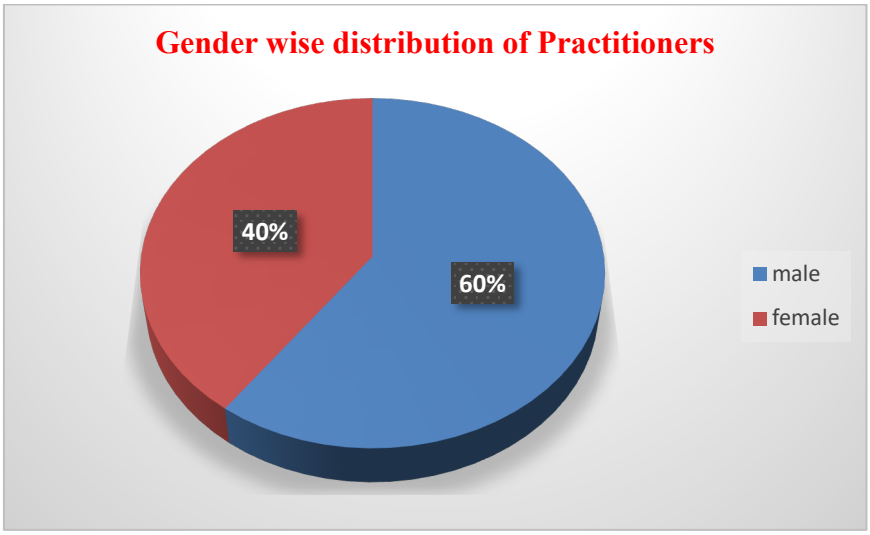

Figure 1: Gender wise distribution of Practitioners

Figure 2: Practice experience in years

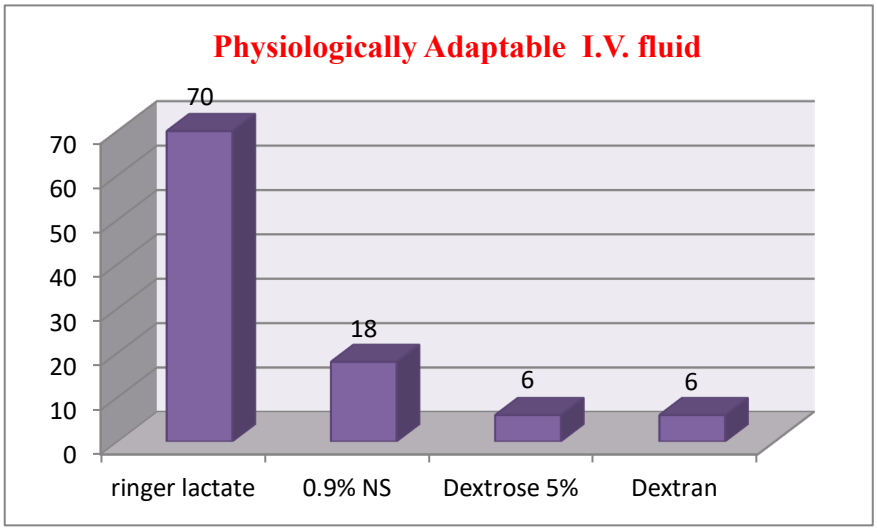

Figure 3: Physiologically Adaptable I.V. fluid

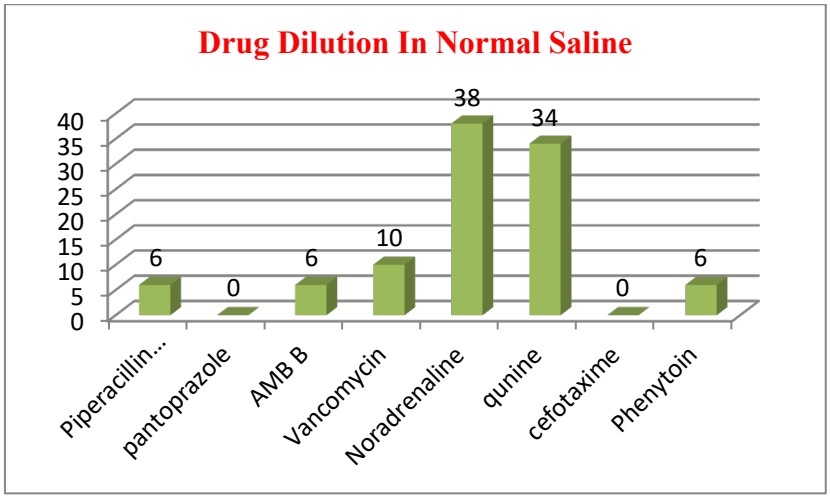

Figure 4: Drug Dilution In Normal Saline

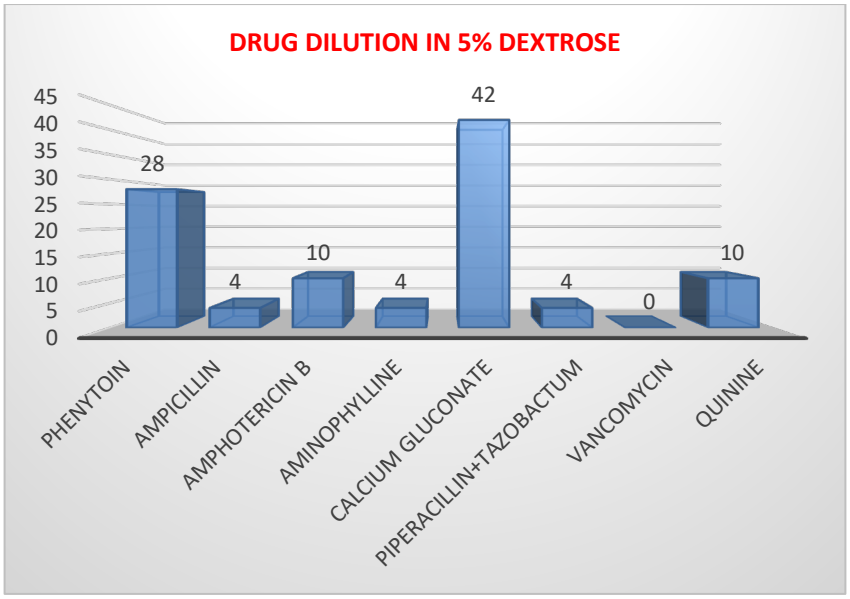

Figure 5: DRUG DILUTION IN 5% DEXTROSE

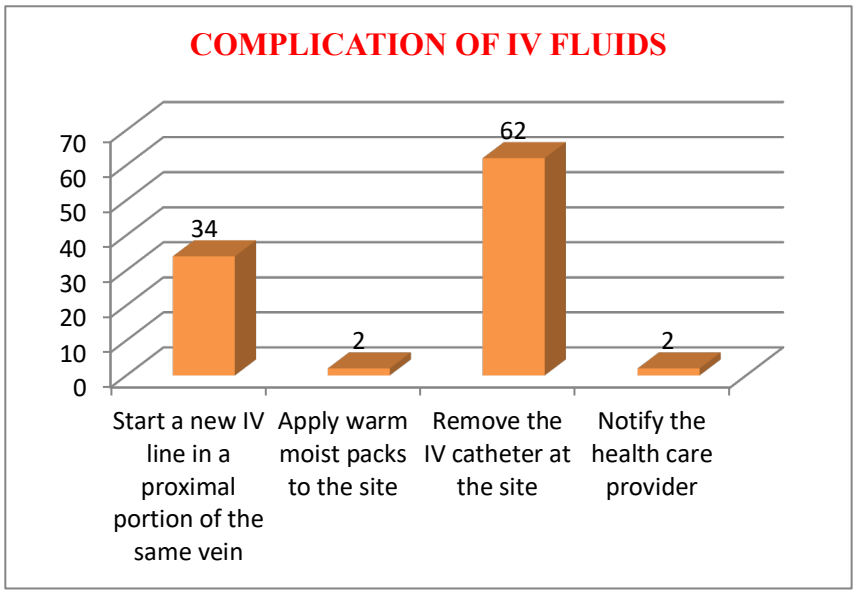

Figure 6: COMPLICATION OF IV FLUIDS

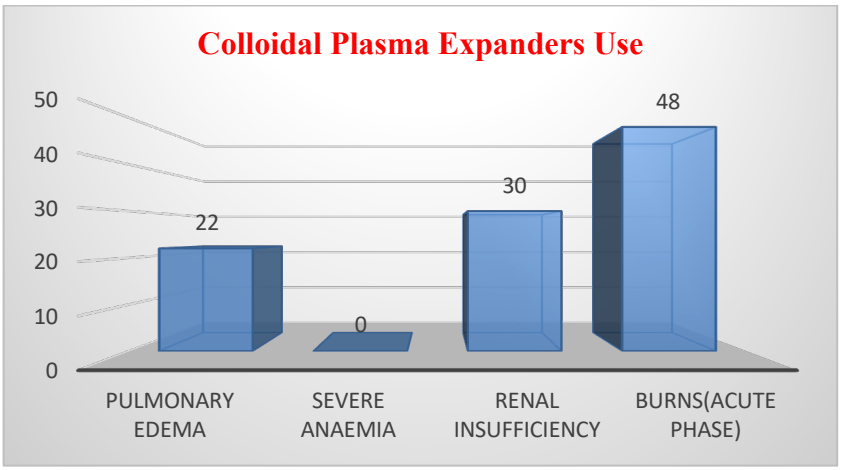

Figure 7: Colloidal Plasma Expanders Use

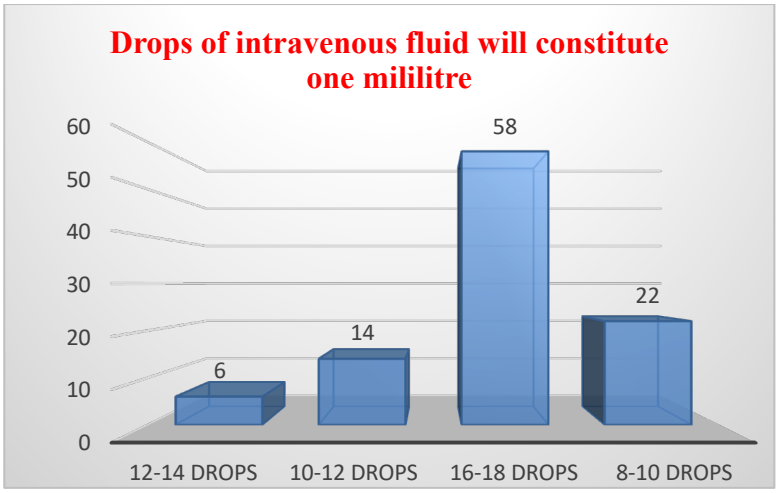

Figure 8: Drops of intravenous fluid will constitute one mililitre

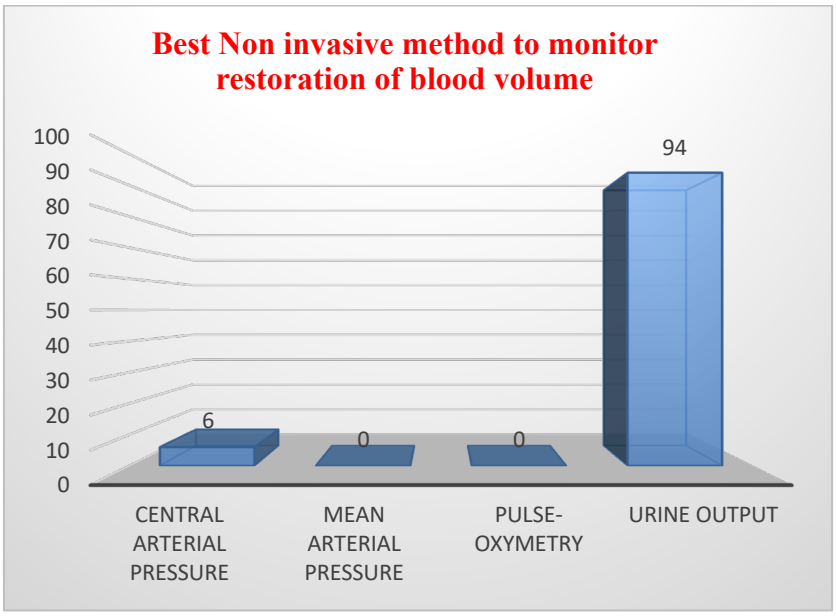

Figure 9: Best Noninvasive method to monitor restoration of blood volume

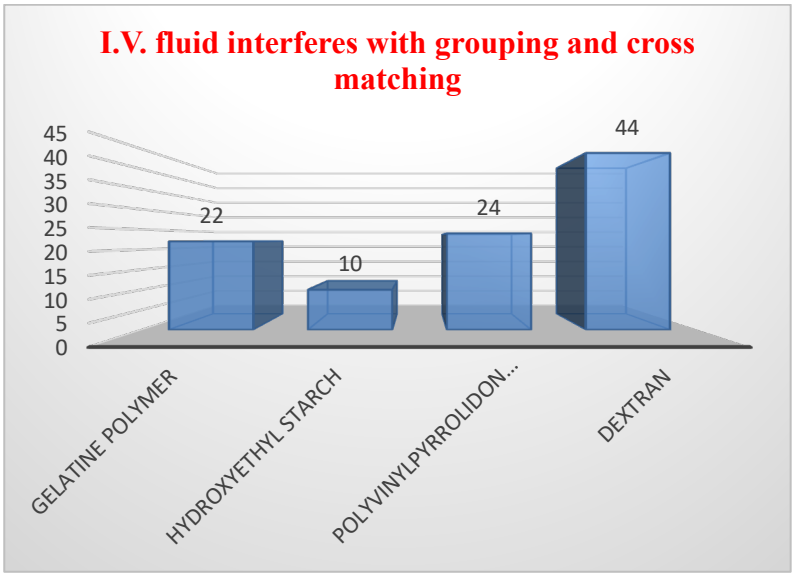

Figure 10: I.V. fluid interferes with grouping and cross matching

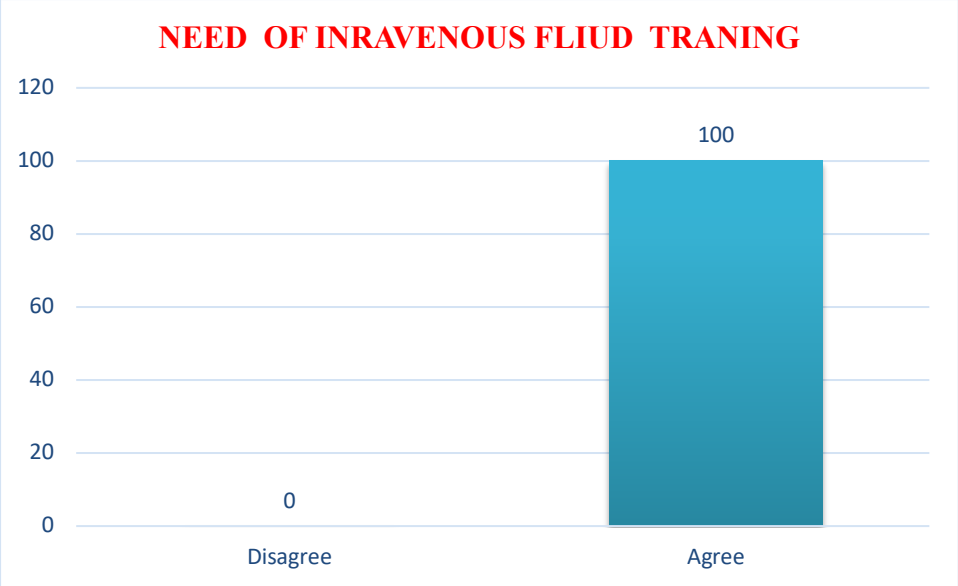

Figure 11: NEED OF INRAVENOUS FLIUD TRANING

Discussion

Fluid management is a common and important part of clinical care of patients. Inappropriate intravenous fluid management is common and known to contribute to a significant proportion of iatrogenic morbidities and mortalities. Despite the clear importance of appropriate intravenous fluid prescription, such practice is often left to be undertaken by the most BHMS practitioners which have received little knowledge about fluid management. This questionnaire survey found there was vast knowledge deficit among BHMS practitioners.

In the previous study by A.P Swayamprakasam and P.B Bijoor including FY1 students highlighting the similar concern, it is quite worrying that knowledge about IV fluid and prescribing is poor in our study also (article 1 7). Similar to the study from Nottingham (article 1 -7) the question about dilution and preparation of IV fluid with normal saline and dextrose 5% was answered correctly by 72% and 30% in our study. Although there may be many reasons for this poor knowledge underline problems must be taken into account and emphasis on teaching and training methods must be given. Despite of GIFTASUP guidelines advising the use of balanced crystalloid and colloid only 30% could answered about conditions where colloidal plasma expanders could not be used.

In the study only 18% of BHMS practitioners correctly answered about the most physiologically adaptable IV fluids which in fact very important to be known. Furthermore it was seen that 62% knew about the complications and dangers of inappropriate use of fluids which was about 99% in the study by CT lim and M. Dunlop including FY1 students. Clearly, this critical area of knowledge needs to be rectified by teaching and training program which in our study was agreed by 100% of the BHMS doctors.

Conclusion

This questionnaire based study in B.H.M.S. practitioners has confirmed the results of previous studies regarding poor knowledge and limited confidence in the prescription of IV fluids among them.

There were gross lacunae in knowledge and practices among homeopathy practitioners regarding the intravenous fluids; therefore present study concludes that an addition of training module is required for homeopathy practitioners before giving them license to practice Allopathy.

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