

Original Research Article

Old dietary cultural practices leading to suboptimal nutritional intake of calories in children with acute viral hepatitis

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Received: 27 May 2020

Accepted: 01 June 2020

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ABSTRACT

Background: Acute viral hepatitis (AVH) is one of the common infections in developing nation. Hepatotropic virus causes AVH and most of the time it has self-limiting course. HAV is most common cause of AVH. Suboptimal dietary cultural practices are common in our nation. This study was done to know the impact of suboptimal dietary practices done in AVH.

Methods: Observational study conducted with 50 children with AVH. Dietary assessment was done at three point of time. First During AVH, second, pre illness and then two weeks after nutritional counselling. Data of dietary modification done by parents/caregiver during AVH recorded. History of herbal medicine taken for treatment of AVH enquired.

Results: HAV positive was (72%), HEV positivity was in 8 (16%) cases, hepatitis B was positive in 4 (8%) children and dual infection HAV+HEV was detected in 2 (4%) children. Many parents did dietary modification due to AVH and also by some local treating physicians, 18 (36%) patients were also on herbal medication for treatment of AVH. During AVH the mean calorie and protein requirement decreased from 96% to 54% and 92% to 43% respectively. Two weeks after nutritional counseling the mean calorie and protein intake increased from 54% to 88% and 43% to 84% respectively. This change in calorie and protein was statistically significant ($p < 0.01$) Non-vegetarian diet preference was restarted in many of them after nutritional counseling.

Conclusions: This observational study revealed that suboptimal dietary cultural practices are prevalent in India. Majority of children were on bland diet and receiving inadequate proteins and calories.

Keywords: Acute Viral Hepatitis, Hepatitis A virus, Children, Diet

INTRODUCTION

Acute Viral Hepatitis (AVH) is one of the common infections seen in developing nation. AVH is hepatotropic viral disease caused by mainly Hepatitis A virus (HAV), hepatitis B virus (HBV) and hepatitis E virus (HEV). AVH is a major public health concern in most of developing nation including India.¹⁻³ Vaccination is not available freely by government for many of the Indian states for HBV and HAV vaccination still too costly to afford by most of the Indians, as there is no free

vaccination for HAV. Children commonly presents with prodrome followed by icteric phase with or without cholestatic features followed by complete resolution in most cases in 8-10 weeks period.⁴ HAV is common in pediatric population and it spread through feco-oral route. Symptomatic and supportive care is mainstay of management of AVH. Optimum nutritional intake is important foundation for recovery and regeneration of inflamed liver cells. Dietary restrictions are not recommended in AVH. Recommending low dietary fat diet is not only associated with prolongation of illness

and recovery but also more complications has been observed.⁵

India is having one of the oldest and richest cultural traditions. Different dietary cultural traditions are followed in different parts of the nation. In various disease conditions also various dietary cultural practices being followed. Indians follow different dietary cultural practices in different parts of country in AVH also. There are many dietary practices, which are very good for the good health and also for disease cure. But there may be some harmful dietary cultural practices being practiced in health and disease conditions.

Practicing suboptimal dietary practices in AVH such as low fat diet, low protein diet, supplementation of hyperosmolar liquids like glucose powder, open fruit juices are still being practiced in various parts of India. On the other hand healthy nutritious foods and food supplements like spices, turmeric, fatty foods, non vegetarian foods are not given by many parents/caregivers, probably because of perception that these spices, fats, protein foods might lead to aggravation of disease process without knowing the fact. Studies in adult shown that adequate intake of fats and oils in diet makes food more tasty and improves palatability and patient calorie intake gets improved.^{6,7}

Even in adults there are very few studies to show the impact of these suboptimal nutritional practices. There is hardly any study in pediatric age group regarding nutritional impact of these suboptimal practices. Children's dietary requirements are being taken care usually by parents or caregiver. Children follow the same dietary cultural practices what their parents or grandparent's perception about the AVH. There is no study in children to know about the nutritional impact of these suboptimal dietary practices still done in various parts of India.

To know the impact of dietary malpractices in children is more important because they are in growing phase and requires more calories and protein. Other important concern is that AVH in children also causes anorexia, which may further compromise protein and calories requirement. So present study was aimed to know the impact of these suboptimal dietary practices in children with AVH, followed by proper dietary counseling and nutritional intervention.

We studied 50 patients of AVH from Pediatric Gastroenterology Department, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow.

METHODS

We had done an observational study carried out on consecutive 50 patients attending to Pediatric Gastroenterology Department, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow.

Following were the inclusion and exclusion criteria for patient recruitment in the cohort where children presented with two or more symptoms such as loss of appetite, jaundice, nausea, vomiting, abdominal pain and itching.

Inclusion criteria

- Serum alanine and serum aspartate aminotransferase level >10 times of upper limit of normal value. (SGOT/SGPT >10 fold)
- Increased serum bilirubin >2gm%
- Elevated or normal serum alkaline phosphatase (ALP)
- Normal peripheral blood counts or just mild leukopenia with or without relative lymphocytosis.
- Duration of jaundice <3 months.

Exclusion criteria

- Pre-existing liver disease.
- Duration of jaundice >3months.
- Patient progressing to acute liver failure (ALF).
- Sick patients of AVH due to any other cause.

Table 1: Diet chart for acute viral hepatitis.

| To be followed | Not to be followed |
|--|--|
| <ul style="list-style-type: none"> • Normal spices • Normal turmeric • Normal salt • Normal oil and ghee/butter • Adequate caloric foods with good protein and carbohydrate value. • Continue non-vegetarian diet if taking earlier. | <ul style="list-style-type: none"> • High osmolality drinks: • Gluon D powder • Glucose solutions • Contaminated fruit juices: • Sugar cane juice • Other fruit juices • Unpalatable foods without oil, spices, turmeric. • Restriction of protein foods. • Restriction of fats, oils |

Detailed dietary intake history was noted by departmental dietician and chart prepared with total calorie and protein intake per day at three point of time (During AVH, pre illness and 2 weeks later after dietary counseling). Detail history was asked about dietary modifications done after the child was detected with jaundice by parents or any clinician. Dietary questionnaire related to Table 1 were asked to child or their parents. Protein and calorie intake percentile per day for the age and sex was calculated at first contact of illness. At the same time the data regarding total calorie and total protein intake per day calculated for pre illness time by historically taking dietary intake per day. Then the patient was given adequate and proper dietary counseling for AVH. The written instructions/chart in Hindi/English were also given to follow at home/hospital (Table 1). Individual dietary meal plan was also given to each child according to his/her preferences, availability and affordability of

food. Compliance of nutritional counseling was done in follow up visits.

Third dietary assessment was taken after two weeks of adequate nutritional counseling at first contact. If patient did not come for follow up in OPD after two weeks then nutritional counseling was done telephonically and/or by mobile whatsapp application message.

History of any intake of herbal medications also taken. The children were divided into three age groups 0-6, 7-12 and >12 years. Acute liver failure (ALF) was diagnosed by PT (Prothrombin time) >15 sec or INR (International Normalized Ratio) >1.5 with features of encephalopathy OR PT >20 sec or INR >2.0 with or without features of encephalopathy. Patients were also tested for Anti-HAV IgM, anti-HEV IgM, HBsAg, Anti-HBcIgM and Anti-HCV to know the viral etiology. Other routine clinical history and examination also done. Patients were admitted to indoor only when they had symptoms of severe nausea, vomiting pain, intractable icterus and INR (International Normalized Ratio) >1.5 times. Admitted children were discharged when their oral intake improved and INR becomes normal (<1.5). Microsoft Excel 2010 was used for statistical analysis and data record. A paired t test was used to assess statistical significance of difference in protein and calorie intake before and during illness. During illness and post counseling compliance was also done using paired t test.

RESULTS

Total 50 children with AVH included in the study. 40 (80%) were males and 10 (20%) were female (Figure 1).

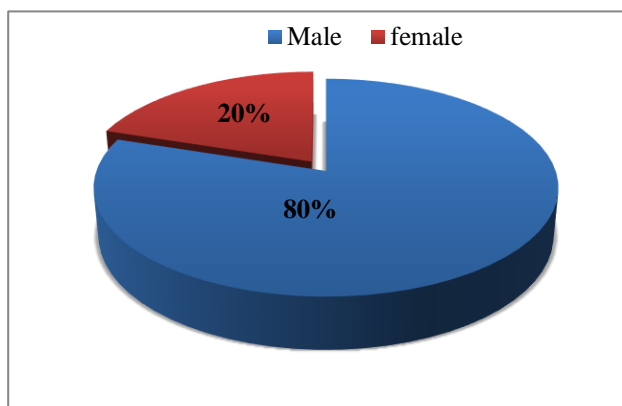


Figure 1: Sex distribution.

Table 2: Demographic profile.

| Age group | AVH | | |
|------------|------|--------|-------|
| | Male | Female | Total |
| 0-6 years | 4 | 1 | 5 |
| 7-12 years | 24 | 5 | 29 |
| >12 years | 12 | 4 | 16 |
| Total | 40 | 10 | 50 |

Mean age of presentation of AVH was 8 years with age range (2-17 years). There were more cases of AVH in the younger children (7-12 years age group) (Table 2).

Majority of cases were HAV positive (72%). HEV positivity was in 8 (16%) cases. Hepatitis B was positive in 4 (8%) children. Dual infection HAV+HEV was detected in 2 (4%) children (Figure 2).

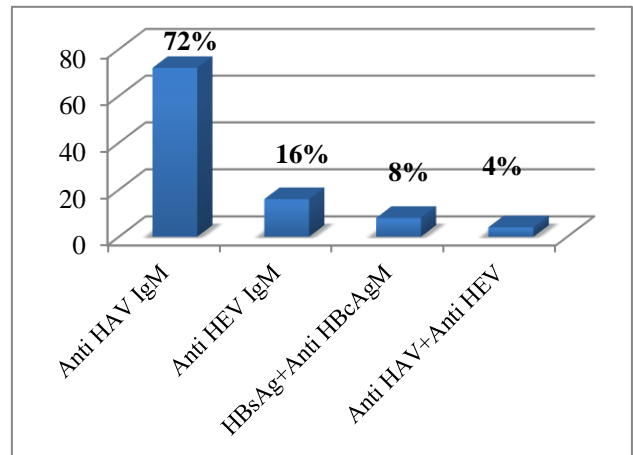


Figure 2: Serology positivity of children.

Almost all the children presented with jaundice. History of prodrome was present in 42 (86%) cases of AVH. Serum Bilirubin was increased in all the children (100%). Anicteric variety of AVH not reported in our study as our center gets only complicated referral cases.

Since our institute is tertiary referral care center, so most of the patients presented after consultation with local physician or pediatrician, 18 (36%) children were also on herbal medication as their family members have good faith in alternative medication, so they preferred to continue both medication at the same time (Figure 3).

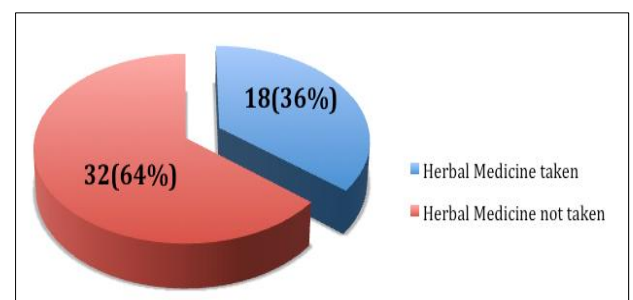


Figure 3: Herbal medicine supplementation.

Due to yellowness of jaundice, 43 (86%) caregivers/parents modified their diet to bland diet. Surprisingly this bland diet was endorsed even by few local physician/pediatrician. In 18 (36%) cases local physician/pediatrician also advised to follow bland diet. In 16 (32%) cases bland diet was endorsed by both parents/caregiver and physician/pediatrician (Figure 4).

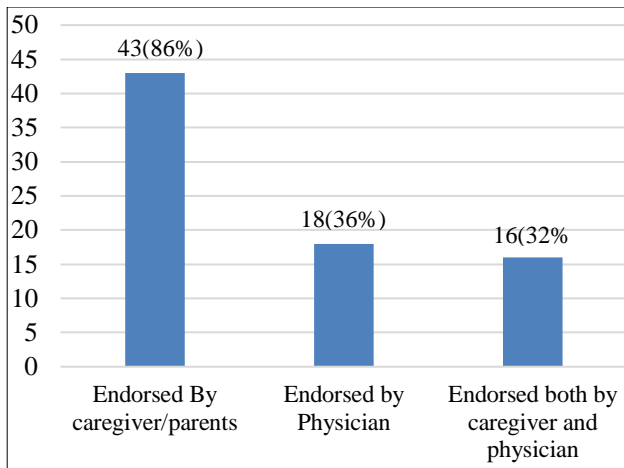


Figure 4: Dietary modifications.

Table 3: Dietary intake in children with AVH before and during AVH.

| | Before AVH | During AVH | p-value |
|---|------------|------------|---------|
| Mean centile intake of calories age and sex wise (SD) | 96% (24%) | 54% (19%) | <0.01 |
| Mean centile intake of protein age and sex wise (SD) | 92% (18%) | 43% (17%) | <0.01 |
| Change in diet from non vegetarian to vegetarian (%) | 21 (42) | 3 (6) | <0.01 |

Table 4: Impact of nutritional counseling.

| | During AVH for counselling | 2 weeks post counselling | p-value |
|---|----------------------------|--------------------------|---------|
| Mean centile intake of calories age and sex wise (SD) | 54% (19%) | 88% (19%) | <0.01 |
| Mean centile intake of protein age and sex wise (SD) | 43% (17%) | 84% (16%) | <0.01 |
| Change in diet from non vegetarian to vegetarian, n (%) | 3 (6) | 14 (28) | <0.01 |

During first contact of children with AVH the mean centile intake for total calorie intake per day was decreased to mean of 54% in children. Total protein intake per day centile was decreased to mean of 43% of the requirement. So there was statistically significant

decrease in protein and total calorie requirement per day. There were 21 (42%) children who were on non-vegetarian diet pre illness. After illness only 3 (6%) were taking non-vegetarian diet. There was statistically significant change from non vegetarian to vegetarian diet in children with AVH (Table 3). When we compared the dietary intake post nutritional counseling two weeks later, there was increase in mean centile calorie intake per day from 54% to 88% ($p < 0.01$). The mean centile intake for protein per day also increased from 43% to 84% ($p < 0.01$).

So there was statistically significant increase in calorie and protein intake per day after two weeks period of post nutritional counseling. There was also change in dietary modification pattern and among 21 (42%) non-vegetarian children; they started having non-vegetarian diet. So from 3 (6%) children it increased to 14 (28%) children post nutritional counseling, which started taking non-vegetarian diet ($p < 0.01$). This change was statistically significant (Table 4).

DISCUSSION

There are many studies to show that AVH is still one of common infectious disease in developing nation including India. There are age-old dietary practices continuing in perception of treating disease, which are common in India. There are some very good and scientific practices, which are there, but there may be some dietary practices, which can be harmful in disease management and recovery. There are various types of plant source in form its roots; bark, leaf juices etc. are being used by various Indian alternative medicines in cases of AVH, with no definite response.⁸ Age wise supplementation of calories and protein is very important for the growth of child for growth and also for recovery during illness.^{7,9,10}

In our study, in a series of 50 children recruited, majority children were male (80%). Only 10 (20%) were female. This may be because of biased referral to our tertiary care institute and also may be due to male preference given for treatment in the Indian society. In our study maximum 29 (58%) cases were in the age group of 7-12 years. In another study done from Nepal by KC et al, in a 368 children with AVH, majority of children were from more than 10 years age group.¹¹ Majority of cases in our study were HAV positive 36 (72%). HEV positivity was 8 (16%), Hepatitis B was positive in only 4 (8%). Dual Infection with HAV and HEV was present in 2 (4%) cases. In most of the study from developing nation HAV was most common AVH infection.^{11,12} Poor hygiene and poor sanitation in developing nation may be contributory factors for more HAV cases in developing nation. In our study around one-third 18 (36%) children were on herbal medication as alternative treatment for cure of AVH. Detailed history also revealed that AVH children living with grandparents were more likely to take these herbal medications as their grandparents have good faith on this

alternative medication. History of prodrome was present in 42 (86%) cases. Prodromal history in various studies obtained is around 70-100% of cases. Although AVH presents as icteric and anicteric both forms, but in our study all the children were icteric and having clinically significant jaundice. This may be because of our center is superspeciality tertiary care center and only complicated cases are usually being referred for the management. Due to yellowness of jaundice 43 (86%) caregivers/parents modified child diet to bland diet. It was very interesting to note that even local treating physician/pediatrician also endorsed the dietary modification in view of jaundice in 18 (36%) cases. In 16 (32%) of cases dietary modification was endorsed both by parents and local physician. Again this dietary modification was more seen in children where there were grandparents at home. So surprisingly some physician also does this dietary modification practice even in this current times.

When we compared with pre illness dietary intake to current AVH time dietary intake, the total calorie intake per day for age and sex was decreased to 54% of daily calorie requirements. Like wise the total protein intake per day for age and sex was decreased by more than half (43%). So there was statistically significant decrease in calorie and protein intake during AVH (Table 3). E. Sathiaraj et al, also showed decrease in calorie and protein in adult population in AVH compared to pre illness dietary intake.⁷ These calorie and protein intake when compared two weeks after nutritional counseling to child/caregiver, there was increase in mean calorie intake centile from 54% to 88%. The mean centile intake for protein intake was also increased from 43% to 84%. This increase in calorie and protein intake was statistically significant ($p < 0.01$). The results also show that many patients changed their children's dietary preferences from non vegetarian-to-vegetarian diet (Table 4).

This was due to parents/caregivers apprehension that non-vegetarian diet is heavy and child cannot digest this. But after proper nutritional counseling, again many of them changed their dietary pattern of their choice. This suggests that majority of caregivers/parents and children were practicing suboptimal nutritional practice. This can lead to increase in recovery time of AVH. Few observational studies in adult and study done on army man in AVH shown that the patients who were given high protein and good calorie diet improved faster than patients who choose only what they like in disease (AVH) time.^{5,6} Children who are given bland diet receive suboptimal calories and protein, are more risk for hospitalization.

These children are also on risk for prolong recovery time from illness. Our study shown that there is statistically significant decrease in calorie and protein intake during illness, which significantly improved after adequate child/caregiver counseling. Bland diet without fats, spices and fats/oils makes food unpalatable and tasteless, which further leads to reduction in calories and protein intake.

There were some parents who also changed the consistency of their children's diet to liquid and semisolid, which further causes intake of more water and less nutrition and hence low calorie and low protein food, which may further lead to suboptimal nutrition.¹³

CONCLUSION

This study in children establishes that suboptimal dietary cultural practices in AVH lead to reduction in protein and calorie deficit. Which may cause under nutrition and prolongation of illness. Due to fear of jaundice children were provided non-palatable bland diet without fats, oils and inadequate protein and calories. So there is need for adequate and proper nutritional counselling by public awareness through electronic, social and print media in large scale. Vaccination for Hepatitis A is still most crucial to implement nationwide. Intake of herbal medicines should not be taken be until RCT data are available to support their role in treatment of AVH.

ACKNOWLEDGEMENTS

Authors would like to thank all the ailed children and their families who consented to participate in this study. The help of Department of Pediatric Gastroenterology and SGPGI institute is greatly acknowledged.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bharti LK, Neelu. Old dietary cultural practices leading to suboptimal nutritional intake of calories in children with acute viral hepatitis. *Int J Contemp Pediatr* 2020;7:1472-7.