International Journal of Homoeopathic Sciences

E-ISSN: 2616-4493
P-ISSN: 2616-4485
www. homoeopathicjournal. com
IJHS 2021; 5(1): 368-373
Received: 27-11-2020
Accepted: 28-12-2020

Dr. Km Om Jee
Assistant Professor, Department of OBS and Gynae, Dr. Yadubir Sinha Homoeopathic Medical College and Hospital Laheriasarai Darbhanga. Bihar, India

Corresponding Author:
Dr. Km Om Jee
Assistant Professor, Department of OBS and Gynae, Dr. Yadubir Sinha Homoeopathic Medical College and hospital Laheriasarai Darbhanga, Bihar, India

Protein energy malnutrition: An overview

Dr. Km Om Jee

DOI: https://doi.org/10.33545/26164485.2021.v5.i1f.341

Abstract
Protein energy malnutrition or Protein energy undernutrition is a form of malnutrition that is defined as a range of conditions arising from coincident lack of dietary protein and / or energy (calories) in varying proportion. PEM is fairly common worldwide in both children and adults and accounts for 6 million deaths annually. By giving proper nutrition to the sufferer along with the support of homoeopathic medicines PEM can be managed very effectively.

Keywords: Protein energy malnutrition, nutrition, health, homoeopathy

Introduction
According to World Health Organization (WHO) malnutrition defines the cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance and specific functions.
Sufferers are mainly-
- Infants, Children, Elderly, Prisoners
- Mentally disabled or ill persons
- People who are suffering from Tuberculosis, AIDS, Cancer.

Nutrients are substances that are crucial for human life, growth, and wellbeing. It is of two types:
1. Macronutrients: Carbohydrates, Protein, Lipid and Water.
2. Micronutrients: Trace elements, Vitamins which are essential for metabolic process.

Definition- "PEM is a range of pathological condition arising out of coincident lack of protein and energy in varying proportions, most frequently seen in infants and young children and usually associated with infections. "
The term PEM applies to a group of related disorders that include:
- Marasmus
- Kwashiorkor
- Intermediate state of Marasmus and Kwashiorker

Epidemiology- The term PEM has been adopted by WHO in 1976.
- It is highly prevalent in developing countries among <5 children severe form 1- 10%, underweight 20%-40%
- All children with PEM have micronutrient deficiency.

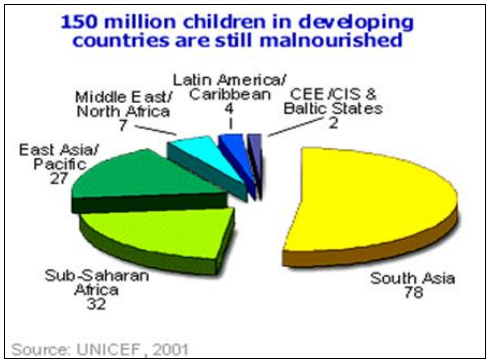
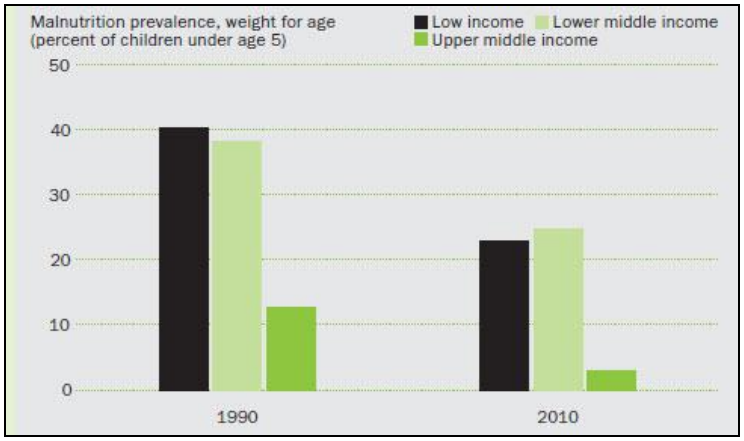


Fig 1: 150 Million children in developing countries are still malnourished



Source: World health organization and world development indicators database

Fig 2: Many children remain malnourished

Clinical Classification.

1.) Gomez Classification

- GRADE 1(mild undernutrition): 90%-75% of expected weight
- GRADE 2(moderate undernutrition): 75%-60% of expected weight
- GRADE 3(severe undernutrition): <60% of expected weight

2). Welcome Trust Classification

- Undernutrition: 80%-60% of expected weight (without Edema)
- Kwashiorkor: 80%-60% of expected weight (with Edema)
- Marasmus: <60% of expected weight (without Edema)
- Marasmickwashiorkor :<60% of expected weight (with Edema)

Aetiology

- **Dietary Deficiency:**

➢ This begins at the fetal stage and continues into infancy and childhood. It is termed as Primary type.

➢ **Secondary malnutrition** arises due to severe illness like Tuberculosis, Cancer, Inability of body to absorb nutrients, Ulcerative colitis, Long standing gastroenteritis

- Inadequate Breastfeeding
- Stopping breastfeeding in case of working mother.
- Ignorance of weaning and weaning foods.
- Mental and psychiatric illness of mother.
- Having twins may lead to the mother producing not enough milk to meet the demand of infants.
- Lower socioeconomic status.

Marasmus

The term marasmus is derived from the Greek word "marasmos" which means withering or wasting. It is a severe form of malnutrition that consists of the chronic wasting away of fat, muscle and other tissue in the body. It involves inadequate intake of protein and calories and characterized by emaciation. It usually occurs in the 1st year of life, resulting in wasting & growth retardation.

Etiology of Marasmus

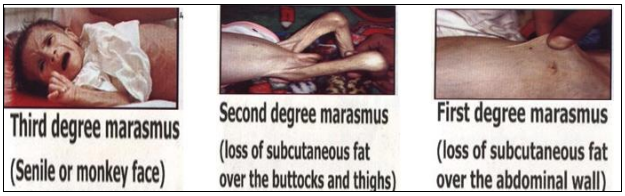
- Dietary errors

Infections like Tuberculosis, Otitis media, Pyelo nephritis, Gastroenteritis etc.

- Endorine causes
- Parasitic infestuation- Ascaris, Ankylostoma, Giardia
- Congenital anomalies- Cardiac–PDA, Renal-Renal Agenesis, Git-Pyloric Stenosis
- Metabolic disease- Galactosomia, Fructose intolerance, Idiopathic hypocalcaemia
- Pre maturity
- Some cases of mental retardation
- Low socio-economic status
- Illiteracy

Assessment Of Marasmic Child/Infant- Failure a to thrive, loss of weight (weight < 60% of expected). Loss of subcutaneous fat: measured at many parts of the body according to the degree:

1st Degree: SC fat in the abdomen wall
2nd Degree: SC fat in the abdomen wall and limbs
3rd Degree: SC fat in the abdomen wall and limbs & face



Symptoms

- Severe growth retardation
- Loss of subcutaneous fat
- Severe muscle wasting
- The child looks appallingly thin
- Limbs appear as skin and bone
- Shriveled body
- Wrinkled skin
- Irritability, fretfulness and apathy
- Frequent watery diarrhoea and acid Stools
- Mostly hungry but some are anoretic
- Dehydration
- Oedema and fatty infiltration are absent

Complications of Marasmus

Intercurrent infection: Broncho pneumonia. is the cause of death
Gastro enteritis
Hemorrhagic tendency, purpura

Hypothermia
Hypoglycemia
Edema (Marasmic Kwashiorkor)

Kwashiorkor- The term kwashiorkor is taken from the Ga language of Ghana and means "the sickness of the weaning". Williams first used the term in 1933, and it refers to an inadequate protein intake with reasonable caloric (energy) intake. Kwashiorkor, also called wet protein-energy malnutrition, is a form of PEM characterized primarily by protein deficiency. This condition usually appears at the age of about 12 months when breastfeeding is discontinued, but it can develop at any time during a child's formative years.
It causes fluid retention (edema); dry, peeling skin; and hair discoloration

Symptoms

- Changes in skin pigment.
- Decreased muscle mass
- Diarrhea
- Failure to gain weight and grow
- Fatigue
- Hair changes (change in color or texture)
- Increased and more severe infections due to damaged immune system
- Irritability
- Large belly that sticks out (protrudes)
- Lethargy or apathy
- Loss of muscle mass
- Rash (dermatitis)
- Shock (late stage)
- Swelling (edema

Table 1: Marasmus Vs Kwashiorkor (differences in both)

Clinical features	Marasmus	Kwashiorkor
Muscle wasting	Obvious	Sometimes hidden by edema and fat
Fat wasting	Severe loss of subcutaneous fat	Fat often retained but not firm
Edema	None	Present in lower legs, and usually in face and lower arms
Weight for height	Very low	May be masked by edema
mental changes	Sometimes quiet and apathetic	Irritable, moaning, apathetic
Appetite	Usually good	Poor
Diarrhoea	Often	Often
Skin Changes	Usually none	Diffuse pigmentation, sometimes 'flaky paint dermatitis'
Hair Changes	Seldom	Sparse, silky, easily pulled out
Hepatic Enlargement	None	Sometimes due to accumulation of fat

Marasmic- Kwashiorkor- A severely malnourished child with features of both Marasmus and Kwashiorkor.
The features of Kwashiorkor are severe oedema of feet and legs and also hands, lower arms, abdomen and face. Also there is pale skin and hair, and the child is unhappy. There are also signs of marasmus, wasting of the muscles of the upper arms, shoulders and chest so that you can see the ribs.

Assessment of Pem

- Interrogation and physical examination including dietary history
- Anthropometric measurement
- Mid arm circumference
- Chest circumference
- Head circumference
- Length
- Standing height
- Weight
- Fat fold thickness

MID Upper Arm Circumference

Nutritional Status	Score	Colour On Strip
Normal	> 13. 5 Cm	Green
Moderately Malnourished	12. 5- 13. 4 Cm	Yellow
Severely Malnourished	< 12. 5 Cm	Red

Fig 3: Shows in nutritional status score colour on strip

Chest Circumference

- Use a tape which is placed parallel to the ground.

Position: At the level of nipple Vs xiphoid process. At birth 3 cm. HC= CC by 1 year,there after CC>HC

Fig 4: Shows in chest and head circumference

Head Circumference - To measure HCUse a flexiblenon – stretchable tape. Position the tape just above the eyebrow, above the ears, and around the biggest part on the back of the head.

- Hc<2 SD – small head
- Hc<3 SD – microcephaly

It is usually occure in late stages of malnutrition.
Length – It is measured by Equipment-Infanto-Meter

- Infant shuold placed on its back,both legs are fully extended at knees.

Standing Heightu seful for >2 yrs age.
Heels, buttock, back in contact with vertical board.

FORMULA FOR AVERAGE HEIGHT

HEIGHT	CM
BIRTH	50
3 MONTHS	60
6 MONTHS	66
1 YEAR	75
2-12 YEARS	[AGE(YEARS) X 6] + 77

Fig 5: Height

FORMULA FOR AVERAGE WEIGHT.

WEIGHT	KG
BIRTH	3
3-12 MONTHS	AGE(MONTH) + 9 / 2
1-6 YEARS	[AGE(YEAR) X 2] + 8
7-12 YEARS	[AGE(YEARS) X 7] - 5 / 2

Fig 6: Weight

Fat Fold Thickness - Measures body fat.

- General guide lines:
  Hold 2cm above measurement site,wait for 3sec.

Investigations

Routine Tests

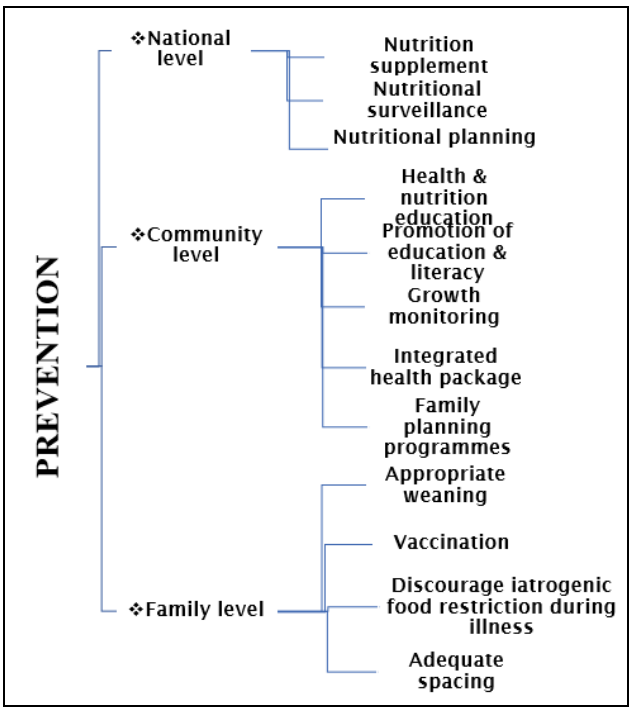
- Full blood counts
- Blood glucose profile
- Stool test
- Urine test
- Electrolytes, protein analysis
- CXR &Mantoux test
- Serum T3,T4,TSH

Non-Routine Tests

- Hair analysis
- Measurements of trace elements levels Fe,Zn,I
- Skin biopsy
- Urine-creatinine over protein ratio

Complications Of Pem – Hypoglycemia, Hypothermia, Hypokalemia, Hyponatremia, Heart failure, Dehydration and shock, Infections(bacterial, viral, thrush)

Prevention



National Nutrition Policy

Programme	Year	Ministry
Mid-Day Meal Programme	1961	Education
Integrated Child Development Services Programme (ICDS)	1975	By ministry of Women and Child Development for the empowerment of Women and Child Development
Mid-Day Meal Scheme	1995	Human Resources Development
Mid-Day Meal Scheme(Revised)	2004	Human Resources Development

National Nutritional Anemia Prophylaxis Programme1970. Accordingly, the supplementation is -

- 100 mg iron+0. 5mg folic acid (pregnancy)
- 20mg iron+0. 1mg folic acid x 100 days (1yr-5yr)

Treatment - There are ten essential steps:

- 1. Treat/prevent hypoglycaemia
- 2. Treat/prevent hypothermia
- 3. Treat/prevent dehydration
- 4. Correct electrolyte imbalance
- 5. Treat/ prevent infection
- 6. Correct micronutrient deficiencies
- 7. Start cautious feeding
- 8. Achieve catch-up growth
- 9. Provide sensory stimulation and emotional support
- 10. Prepare for follow-up after recovery
- These steps are accomplished in two phases: an initial stabilisation phase
- where the acute medical conditions are managed; and a longer rehabilitation phase. Note that treatment procedures are similar for marasmus and kwashiorkor.

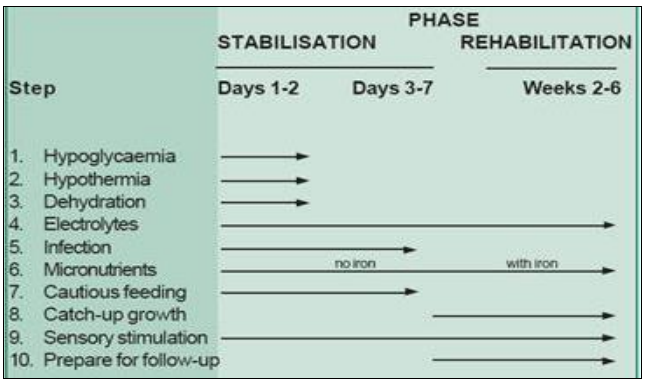


Fig 7: Shows in stabilisation phase rehabilitation

Homoeopathic Management

Homoeopathic system of medicine is having multidimensional approach of healing. By homoeopathic medicines we treat each person as an individual personality so, by our medicines we can give the patient total balance of physical mental and emotional health. As WHO defines the health 'It is A state of complete physical mental and social well-being and not merely the absence of disease or infirmity. ' Some medicines with their marked indication of prescribing are-

- **Abrotanum**-It is a useful remedy for marasmus especially of lower extremities. Neck so weak, cann't hold the head. Falling out of hair. Skin looks flabby and loose. The child has good appetite, but emaciation progress. Stomach feels as if swimming in water. Rheumatism following checked diarrhea. Food passes undigested.

- **Acetic acid**-Grand remedy for kwashiorkor. Emaciation of extremities. Oedema of feet and legs. Skin pale, waxen, oedematous. Good remedy for wasting and debility. Argentum nit-Emaciation of extremities. Great craving for sweets. Lack of co-ordination of muscles. Weak digestion. Diarrhea immediately after eating and drinking.

- **Baryta carb**-Emaciation with glandular swelling. Who are lazy, pot-bellied, and who suffer from great physical and mental debility. The child wants to eat all the time. Does not like sweet things or fruit and a little food satisfies.

- **Calcareacarbonica**-The Calcarea are all valuable in marasmus. Valuable remedy for scrofoulous tendencies. The carbonate has the defective nutrition and suits cases where the acidity predominates. There are sour stools and vomiting of milk. There is sweat on scalp, head and face, the feet are damp and cold. Enlargement of the glands and voracious appetite. The mesenteric glands are engorged and the fat of the body wastes. The body dwindles, yet the abdomen remains prominent. The appetite may be morbid, craving indigestible articles.

- **Iodum** - It has the symptoms of extreme hunger, yet, in spite of this, the patient emaciates rapidly. It seems to suit acute cases with more or less febrile action. The face is yellow and shrunken. The joints are swollen and deformed.

- **Natrum mur**-It is a grand remedy for marasmus. Marked emaciation of neck. Desire for extra salt. Appetite is ravenous, but patient grows thin. Skin is scurfy and may develop oozing eruption. Appetite is ravenous, but patient grows thin. Skin is scurfy and may develop oozing eruptionMouth and throat are dry, constipation.

- **Sanicula aqua**-Useful remedy for marasmus. Sweating of head at night which wets the pillow. Offensive foot sweat, dirty and greasy. Progressive emaciation. Skin wrinkled about neck and hands in folds. Mentally obstinate and head-strong, constantly changing.

- **Silicia terra** - Useful remedy for malnutrition in children. Imperfect assimilation and consequent defective nutrition. Scrofulous, rachitic children, with large head, open fontanelles and sutures, with large abdomen, slow in walking. Patient is cold, chilly, < in winter. Swelling of glands. Constipated baby. Skin is pale, waxy, cracks at the end of fingers, crippled nails.

- **Sulphur** - Suits old looking children who have much heat about the head and cold feet. A hard, distended abdomen and a dirty, sallow, shrivelled skin. Skin hangs in folds; the fingers are emaciated, almost resembling knitting needles. The stools are acrid, making the anus sore, and the child has an offensive

faecal odour about it. There is excessive hunger at 11 A. M. The skin is apt to be covered with various eruptions, eczema predominating.

- **Tuber culinum**- It is a inter current remedy. When there is tubercular family history it is suited. It is given when symptoms are constantly changing and well selected remedy fail to improve. Rapid emaciation. Diarrhoea in children running for weeks, extreme wasting, bluish pallor face. Patient is lean, thin, tall.

Conclusion

PEM is a worldwide problem especially in developing countries. PEM is not only a disease actually it is a group of sufferings which are either due to improper nutrition or improper assimilation of that nutrition. So therefore, when dealing with PEM we must aware about all the factors, the causes and their removal in the form of proper diet and necessary medications. By giving homoeopathic medicine on the basis of homoeopathic principle, we can easily restore the health of any person.

References

1. Kliegman Stanon R *et al*, Nutrition, Nelson Textbook of Pediatrics, Edition 20 Philadelphia, PA: Elesvier 2016;1:544.
2. Ghai OP. Nutrition, Ghai Essential Pediatrics 9th Edition, CBS Publishers & Distributers Pvt Ltd, New Delhi 2019, 86.
3. Parthasarathy A. Growth, IAP Textbook of Pediatrics 7th Edition, Jaypee Brothers Medical Publisher (P) Ltd. 2019, 85.
4. Sardesai Vishawanath. Nutrition in Children, Introduction To Clinical Nutrition, 3rd Ed. Crc Press Publication 2017, 204.
5. Park K. Parks Textbook of Preventive and Social Medicine. 19th Ed. Jabalpur: Banarsids Banot; Nutrition and Health 2007, 507.
6. Allen HC. Keynotes and Characteristics With Comparisons Of Some Of The Leading Remedies Of The Materia Medica With Bowel Nosodes, 8thEdition, B Jain Publishers, New Delhi 2013;(1,2):39,55,73.
7. Kent JT. Homoeopathic Materia Medica, Reprint Edition, B Jain Publishers, New Delhi 2006, 18
8. Dewey WA. Practical Homoeopathic Therapeutics, 3rdEdition Revised and Enlarge, B Jain Publishers New Delhi 2005, 258.
9. Murphy Robin. Lotus Materia Medica, 3rdEdition, B Jain Publishers, New Delhi 1996, 452.
10. Boericke William, Boericke's, New Manual Of Homoeopathic Materia Medica With Repertory, 3rd Revised And Augmented Edition, B Jain Publishers, New Delhi. 2018;3,6,66,96,129,308.
11. Wallace, Taylor C, Nutrition Today. Optimizing Dietary Protein For Lifelong Bone Health:. Adi BS. Efficacy of homoeopathic medicines in chronic low back pain: a clinical study. International Journal of Alternative and Complementary Medicine. 2020, 17-20. A Paradox Unrevealed 2019; 54(3):107.
12. Patric J, Skerrett, Ma, Walter C *et al*. Essential Of Healthy Eating : A Guide, Available At J Midwifery Womens Health 55, 603.
13. Timnewman. What Is Nutrition and Why Does It Matter, 09-01-2020, Medical news Today. Com On Dated 10-01-2021
14. Khadilkarvv, Khadilkar Avchoudhry P *et al*. Iapgrowth Monitoring Guidelines for Children From Birth To18 Years. Indian Pediatrics. Pubmed, 1992, 29.
15. UNICEF. Underlying Causes of Undernutrition: Food Insecurity. Last Retrived On 11-09-2020). Www. Unicef. Org
16. Jha R, Gaiha R, Kulkarni VS. Child undernutrition in India. ASARC Working 2010 Available On Http://Rspas. Anu. Edu. Au/Papers/Asarc/W2010-11. Pdf
17. Cssm Review. Government of India, A Newsletter On Child Survival And Safe Motherhood Program No. 1995, 25.
18. Williams CD. Kwashiorkor: A Nutritional Disease of Children. Lancet 1935;2:1151-1152.
19. Nanakwe Neweze. The Effect And Causes Of PEM IN Nigerian Children, Nutrition Research, Science Direct 1995;15(6):785.
20. 20WWW. FAO. ORG(Food And Agriculture Organization Of The United Nation) 10-09-2020
21. UNICEF. ORG(United Nations Children's Fund) 10-09-2020
22. WHO. INT(World Health Organisation) Last Retiverd On 10-09-2020
23. Healthy children. Org, A Teenager's Nutritional Needs, Last Retrived On 21-09-2020