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West Bengal Academy of Pediatrics

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Editorial

Dear readers,

As we step into the month of July, we find ourselves at the intersection of gratitude and progress. July 1st marks National Doctors Day, a day when we honor the legacy of Dr. B. C. Roy, an eminent physician and the first chief minister of West Bengal. On this occasion, we extend our heartfelt wishes to all the dedicated doctors who tirelessly serve our communities. Your commitment to healing and compassion inspires us all.

In this issue, we express our sincere appreciation to everyone who has contributed articles to our journal. Your insights, research, and clinical experiences enrich our collective knowledge and drive us toward excellence. We encourage each one of you to continue sharing your expertise and discoveries with us.

Our editorial board is steadfast in its mission to index this journal. We believe that organized knowledge empowers progress. As we work toward this goal, we invite you to be part of our journey. Your contributions matter, and together, we can create a valuable resource for the medical community.

The West Bengal Academy of Pediatrics (WBAP) remains committed to advancing pediatric care. Our successful implementation of various modules from the IAP Presidential Action Plan 2024 across the state reflects our dedication to professional growth and collaboration. We are proud to be at the forefront of pediatric education and advocacy.

Additionally, our E-library series has taken off, providing accessible learning resources for our postgraduate students. The Sandhya Pathsala initiative, another unique endeavor by WBAP, continues to thrive. Its impact on the next generation of pediatricians cannot be overstated.

The new format of WBAP Clinical Case presentation, In the form of WBAP Clinical Case Challenge is successfully being organized by different medical colleges,

Lastly, the college rounds for the IAP Postgraduate Quiz are underway, promising exciting competition and knowledge-sharing. We eagerly await the results as July draws to a close.

Thank you for being part of our vibrant community. Together, we shape the future of pediatric healthcare.

Warm regards,

Dr Kaustav Nayek
Editor-in-Chief

President's Address

Bronchial asthma as an aetiology of chronic cough

Asthma is a prevalent and significant aetiology of chronic cough in children, characterized by chronic inflammation of the airways leading to episodes of wheezing, shortness of breath, chest tightness, and cough. In some children, chronic cough may be the primary or even sole symptom, a condition often referred to as cough-variant asthma. The pathophysiology of asthma involves a complex interplay of genetic and environmental factors resulting in airway hyperresponsiveness, inflammation, and remodelling. Persistent inflammation of the bronchial mucosa increases sensitivity and irritation, triggering a cough reflex. Bronchoconstriction narrows the airways, provoking coughing as the body attempts to clear perceived obstructions, while increased mucus production leads to coughing as the body tries to expel excess secretions. Airway hyperresponsiveness makes the airways overly responsive to various stimuli, such as allergens, cold air, exercise, or infections, leading to frequent coughing episodes.

Asthma-related chronic cough can present in various ways. In cough-variant asthma, cough is the predominant or only symptom, which can be challenging to diagnose without classic wheezing and shortness of breath. Nocturnal cough often worsens at night, disrupting sleep and indicating poorly controlled asthma. Physical activity can trigger coughing in asthmatic children, often the first indication of underlying asthma. Diagnosing asthma as a cause of chronic cough involves a comprehensive evaluation, including a detailed medical history, physical examination, and lung function tests like spirometry to demonstrate reversible airway obstruction. A positive bronchodilator response supports the diagnosis. In cases where spirometry is normal, a methacholine challenge test may assess airway hyperresponsiveness. An empirical trial of bronchodilators and inhaled corticosteroids can also help confirm the diagnosis if symptoms improve with these medications.

Managing asthma-related chronic cough involves short-term relief and long-term control strategies. Inhaled corticosteroids (ICS) are the cornerstone of asthma management, reducing airway inflammation and preventing symptoms. Short-acting beta-agonists (SABAs) provide quick relief from acute symptoms by relaxing airway muscles. Leukotriene receptor antagonists (LTRAs) can help control symptoms, especially in children. Long-acting beta-agonists (LABAs), often used in combination with ICS, provide long-term control in moderate to severe asthma. Identifying and avoiding asthma triggers, such as allergens, smoke, and pollution, is crucial. Developing a personalized asthma action plan with the child and family helps manage symptoms and recognize exacerbations early.

Regular follow-up is essential to monitor asthma control and adjust treatment as needed. Peak flow meters allow children to monitor lung function at home, helping detect early signs of worsening asthma. Keeping a symptom diary aids in managing and adjusting treatment plans, while periodic spirometry assesses asthma control and guides medication adjustments. Asthma, a common and important cause of chronic cough in children, requires a comprehensive approach for diagnosis and management. Effective management with anti-inflammatory medications, bronchodilators, and trigger avoidance can significantly improve symptoms and quality of life for affected children. Regular monitoring and follow-up ensure optimal asthma control and prevent exacerbations.

Asok Kumar Datta
President
West Bengal Academy of Pediatrics

Evaluation of Upper Airway Problems And Asthma As Etiologies of Chronic Cough In Pediatric School-going Population of The Himalayan Region

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Introduction:

Chronic cough is a very common problem [1]. Though the time limit beyond which a cough is considered to be chronic has been variously defined over the years,generally a cut-off of 3 weeks is accepted [1,2].Chronic cough may be the presenting symptom of multiple underlying pathologies and hence a systematic approach is essential for etiological diagnosis [1,3]. It is a common observation that most cases of chronic cough in children due to respiratory causes are treated with anti-asthma medications or antibiotics. However, upper airway conditions (called as upper airway cough syndrome) like rhinosinusitis or drainage from upper airways or postnasal drip, are also important under-recognized causes of chronic cough in the children.The present study was conducted to compare the prevalence of asthma versus that of upper airway problems in children with chronic cough.

Methods:

A descriptive observational cross sectional studywas conducted between July 2012 and June 2013 in the Himalayan range of east Sikkim district and Sub-Himalayan Terai region of Darjeeling district of West Bengal.The study was approved by the institutional ethics committee and written informed consent was taken from parents/caregivers of all participants included in the study. One thousand and one school children aged 6-11 yrs were recruited from 16 schools in the study area using systematic random sampling method.The clinical and epidemiological information were obtained from the included children using a questionnaire which included prevalidated criteria for diagnosis of bronchial asthma (modified American Thoracic Society Criteria)[4,5] and Minirhinoconjunctivitis Quality of Life questionnaire. According to ATS questionnaire cough for 4 or more days/week for as much as 3 months was considered as chronic cough [4]. All the children underwent pulmonary function testing (FEV1 and FVC)by spirometry.Spirometry was done as per standard protocol in a comfortable environment. The test was repeated thrice andthe reproducibility criterion(used as an indicator of test validity) was met only if two largest values of FVC were within 0.150 L of each other.If the criterion was met, the test session was concluded and the best FEV1 effort and the best FVC of the three were selected.FEV1/FVC less than 80% was considered as abnormal.Children with abnormal lung function test were given 4 doses of 100µg salbutamol inhalation using a metered dose inhaler with a spacer [5] followed by repetition of testsafter fifteen minutes. A diagnosis of asthma was considered if there was an increase in FEV1 by more than 12%.If there was no improvement even after bronchodilator therapy, the child was sent for further evaluation. The children scoring more than 15 with at least 2 scoring in one of the nasal symptoms mentioned in Minirhiniconjunctinctvitis Quality of Life questionnaire were classified as having upper airway problems (UAP). Peak nasal flow rate (PIFn) was measured in all children by Clark's peak nasal flow meter. Three PIFn measurements were taken with an interval of atleast thirty seconds between each reading.The maximum of these three measurements was recorded.

Data were entered in Microsoft Excel 2007 spreadsheets and analyzed using SAS 9.4 (SAS

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Institute Inc., Cary, NC, USA) and IBM SPSS Statistics version 22.0 (IBMCorporation, NY, USA). While Fisher's exact test was used to test associations between categorical variables, the normality of distribution of continuous variables was tested using Kolmogorov–Smirnov and Shapiro–Wilk tests.A generalized linear model was used to account for the effect of multiple predictors on the dependent variable. Two-tailed P value <0.05 was considered as statistically significant.

Results

A total of one thousand and one children, aged between 6 years to 12 years were included in the study. Of them, 722 (722/1001, 72.13%) were males. Majority (407, 40.66%) of the included children belonged to the age group 10-12 years. (Table 1)

Table 1: Age and gender distribution of the study population

		Female	Male	Total
Age group	I (6-8y)	70 (6.99%)	208 (20.78%)	278 (27.77%)
	II (8-10y)	84 (8.39%)	232 (23.18%)	316 (31.57%)
	III (10-12y)	125 (12.49%)	282 (28.17%)	407 (40.66%)
	Total	279 (27.87%)	722 (72.13%)	1001 (100%)

Two hundred and seventeen children (217/1001, 21.68%) included in the study had chronic cough, while upper airway problems and asthma were present in 168 (168/1001, 16.78%) and 81 (81/1001, 8.09%) participants respectively. Both asthma and upper airway problems were coexistent in 44 (44/1001, 4.4%) children. The prevalence of chronic cough was highest in children aged 6-8y (79/278, 28.42%), followed by those aged 10-12y (88/407, 21.62%). Both upper airway problems (52/278, 18.71%) and asthma (34/278, 12.23%) were most prevalent in the 6-8y age group. No statistically significant gender difference was found in the prevalence of chronic cough (Fisher's exact test, Two-tailed P=0.231), upper airway problems (Fisher's exact test, Two-tailed P=0.397) and asthma (Fisher's exact test, Two-tailed P=0.605) in the study population.

Among 217 children with chronic cough, purely upper airway problems were seen in 121 (121/217, 55.76%) cases, while 38 (38/217, 17.51%) cases had only asthma. Coexistent asthma and upper airway problems were found in 44 (20.28%) cases. 14 (14/217, 6.45%) cases did not fit the diagnosis of either asthma or upper airway problems.

The mean peak nasal inspiratory flow rate (PIFn) in the study population was 67.23 (95% CI 66.28-68.18, SD 15.35) L/min, while the median (IQR) PIFn was 65L/min (55L/min-80L/min).

A generalized linear model [IFR (y) = a + b1 * age + b2*sex + b3*height + b4*weight + b5*Mini RLQ Score + b6*Asthma + b7*UAP+ b8*(Asthma*UAP) + error] was constructed for evaluating the role of different predictor variables on inspiratory flow rate. The choice of relevant variables to be included in the

Table 2: Model diagnostics

Source	DF	Sum of Squares	Mean Square	F Value	Pr> F
Model	8	224639.8127	28079.9766	2563.69	<.0001
Error	992	10865.3401	10.9530		
Corrected Total	1000	235505.1528			

Table 3: Goodness-of-fit table

R-Square	CoeffVar	Root MSE	Inspiratory flow rate mean
0.953864	4.922709	3.309526	67.22977

Table 4: Type III sum-of-squares table for individual predictors

Source	DF	Type III SS	Mean Square	F Value	Pr> F
Age	1	10195.41709	10195.41709	930.84	<.0001
Sex	1	2.47227	2.47227	0.23	0.6348
Height	1	73.67307	73.67307	6.73	0.0096
Weight	1	50.69626	50.69626	4.63	0.0317
Asthma	1	324.59546	324.59546	29.64	<.0001
UAP	1	49.22335	49.22335	4.49	0.0343
Asthma *UAP	1	1100.10279	1100.10279	100.44	<.0001
MiniRLQ Total score	1	14039.90350	14039.90350	1281.84	<.0001

model was through an earlier model selection study.The differences between different levels of Asthma, UAP and their interaction term Asthma*UAP were also evaluated. Tables 2, 3 and 4 respectively show the model diagnostics, goodness-of-fit and Type III sum-of-squares for individual predictors. Age, height, weight, presence of asthma, upper airway problems or both, and mini RQL score were found to be significant predictors of inspiratory flow rate.

From our generalized linear model, three different categorical variables emerged that were all statistically significant, asthma, UAP and the interaction between the two, Asthma*UAP. While a significant difference between the levels of Asthma & UAP (both binary variables)can be seen from Table 4 itself, an in-depth analysis of the interaction variable Asthma*UAP (with 4 levels) was necessary to identify pair-wise differences (Tables 5 and 6). Children without asthma or UAP were different from everyone else in terms of the IFR distribution, as evidenced by the first column of P-values in Table 6. Similarly,

Table 5: Least squares means for different levels of interaction variable

Asthma	UAP	Inspiratory_Flow_Rate LSMEAN Number	LSMEAN
No	No	66.9940060	1
No	Yes	69.6317869	2
Yes	No	68.8135561	3
Yes	Yes	63.0257718	4

Table 6: Least-squares mean comparison for the interaction variable: Asthma*UAP

Least Squares Means for effect Asthma*UAP Pr> |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Inspiratory Flow Rate				
i/j	1	2	3	4
1		0.0010	0.0017	<.0001
2	0.0010	0.4173	<.0001	
3	0.0017	0.4173		<.0001
4	<.0001	<.0001	<.0001	

children with both asthma and UAP also differed significantly from all the other groups, as evidenced by the bottom column of the P-value matrix.

Discussion

In this study the prevalence of chronic cough, upper airway problem and asthma were 21.7%, 16.8% and 8.09% respectively. Questionnaire data from earlier studies by Faniran et al [6] and Kelly et al [7]suggest that less than 10% of preschool and early schoolaged children have persistent, chronic cough unrelated to colds, and unaccompanied by wheeze. Luyt et al[8] found that as many as 22% children of preschool age reported chronic cough without colds. In anotherstudy done by Paramesh H et al, the prevalence of chronic cough was found to be as high as 29.5%[9].In this study the prevalence of asthma and upper airway diseases are on the higher side.Also the prevalence of upper airway problem was more than that of asthma in children with chronic cough.Currently it has been suggested that bacterial bronchitis,a possible precursor of bronchiectasis is an important cause of childhood chronic cough [10].

In the present study purely upper airway problems were seen in 55.76% cases and 17.51% cases had only asthma. Our results compare well with the previous observational study by Bailey et al[11] which reported that one of the main etiologies for pediatricchronic cough was upper airway problem. In our study, nasal PIFR was found to well correlate with upper airway problems.Significantly lower PIFn values in patients with upper airway problems when compared with general population can be explained by the fact that upper airway problems like allergic rhinitis are significantly and directly associated with irreversible nasal airway obstruction. A significantly lower value of nPIFR in patients with upper airway problems has been previously reported by Wilson AM et al [12] whoalso suggested using nPIFR as a sensitive index for diagnosing upper airway problems. In 2012, Krzych-Falta et al [13] reported lower peak nasal inspiratory flow rates in children with allergic rhinitis and bronchial asthma compared to the normal population. Similar findings were also suggested by Nagaraju et al [14] from their study on 100 Indian children aged 6-18 years suffering from allergic rhinitis. Nagaraju et al also reported that the peak nasal flow changes linearly with the severity of allergic rhinitis.

An increase of nPIFR with age, height and weight was seen in our study which is consistent with

previous results reported by Prescott et al [15]. An age dependent increase in nasal peak inspiratory flow rate has also been reported by Papachristou et al [16] and van Spronsen et al [17]. However, the measurement of nPIFR is not without limitations. As has been suggested by Phagoo et al [18], erroneous values of peak nasal inspiratory flow rates can be obtained under conditions of increased intrapulmonary resistance or a lower than maximal effort by the patient.

The present study is limited by its questionnaire-based approach and the lack of follow-up of the patients. However, to the best of our knowledge this is the first study from India evaluating the etiological spectrum of chronic cough among a large number of school-going children residing in hilly areas. Further studies can be expected to yield a better picture of this important problem.

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Spreading Mass Awareness In Cardiopulmonary Resuscitation over last two years in West Bengal

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Abstract :

Background Lack of Cardiopulmonary Resuscitation (CPR) Awareness is a big health challenge in India. Among India's population less than 2% are aware of Cardiopulmonary Resuscitation (CPR). About 4,280 people per one lakh population are getting cardiac arrest per year in this country. Every minute 112 people are succumbing to cardiac arrest.

Methods : Mass Awareness Programs are being conducted in different parts of India to spread the knowledge and skills of basic life support among the common people as well as the health care providers. The CPR week is observed every year around 21st July to commemorate the birth anniversary of Dr Anand Shandilya, a torch bearer in this journey of IAP CPR Mass Awareness activities in India.

Presently, three different CPR Mass Awareness Programs are being organized.

1. IAP CPR Mass Awareness Program for Health care providers (Sanjeevni). Table 1
2. Hands on training in IAP CPR following e-Sanjeevni, i.e. an e-BLS modulewith online videos and post-test developed during COVID 19 pandemic. Table 2 [1]
3. Non-medical persons certificate course in IAP CPR. Table 3

Results : 2541 participants with 1109 Health care providers, 487 MBBS students and 1205 non-medical persons were trained in the skills of basic life support by hands on practice on CPR manikins in different parts of West Bengal following a structured course.

Keywords Cardiopulmonary resuscitation, rescue breathing, high quality CPR, Mass Awareness Program

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This endeavor would not have been possible without the active participation of Dr Arun Kumar Manglik, Dr Debjani Gupta, Dr Srabani Chakraborty, Dr Amitabha Chattopadhyay, Dr Subrato Chakrabartty, Dr Nihar Ranjan Mishra, Dr Dibyendu Raychaudhuri, Dr Shaon Mitra, Dr Guruprasad HS, Dr Kripasindhu Chatterjee, Dr Niladri Sekhar Bhunia, Dr Amrita Roy, Dr Kaushik Maulik, Dr Ashik Majumder, Dr Poonam Joshi, Dr Jamuna Rani R and Ms Ambalika Bhattacharya in the various mass awareness activities.

Introduction:

Cardiopulmonary resuscitation (CPR) is a lifesaving procedure in any victim with sudden cardiac arrest which may occur in a variety of situations, both in and out of hospital circumstances. Sudden cardiac arrest in adults is often due to cardiac causes including rhythm abnormalities like ventricular fibrillation or pulseless ventricular tachycardia. Major cause of cardiac arrest in children is due to respiratory failure and/or shock. A victim of cardiac arrest has the best chance of recovery if the CPR is

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administered by the person standing next to him, immediately on recognition of the condition. [2] Majority of cardiac arrest occurs at home and it is witnessed in 85% of cases. 95% of those who experience sudden cardiac arrest, die because of not receiving timely intervention. CPR has to be initiated immediately upon recognition of sudden cardiac arrest. [3] Every minute delay in initiation of CPR increases the chance of mortality by 17%.The hands-only CPR recommendation applies to both untrained bystanders and first responders.It is always better to try than to do nothing at all. The difference between doing something and doing nothing could be someone's life.

IAP ALS BLS group is actively involved in ensuring globally acceptable evidence-based guidelines on resuscitation, and makes a strong partner with similar bodies.[4]

Goal

- Neurologically intact survival of a child/adult following an integrated approach.

Aims and Objectives

- Prevention and reduction of mortality
- If confronted with the collapse victim,adhere to the standard protocol
- To enhance the cognitive and psychomotor capabilities of the health care providers as well as common people by providing pre-course material and hands on training
- Developing the leadership qualities & learning to work as a team [5]

Materials and methods

Pre course material was shared with the participants in the form of online videos

Courses available under the IAP CPR Mass Awareness Program

- IAP CPR Mass Awareness Programs for Health Care Providers, Sanjeevni. Table 1
- Hands on training in IAP CPR following e-Sanjeevni for MBBS students. Table 2
- Non-Medical Persons Certificate Course in IAP CPR. Table 3

Period of study: July 2022 to June 2024

Training Aids and Equipment

- Manikin with CPR rate and depth monitor
- Prestan adult CPR torso- 4 in number and
- Prestan Infant CPR manikins - 6 in number
- Manikin without CPR rate and depth monitor
- Laerdal little anne – 2 in number
- Laerdal baby anne – 2 in number
- Demo Automated External Defibrillator (AED) – 2 in number
- Ambulatory manual breathing unit (AMBU)
- Adult (1 litre) – 6
- Pediatric (500 ml) – 6
- Infant (250 ml) – 6
- Barrier device for mouth-to-mouth breathing – 2
- Sanitizer and gauge pieces
- Mattress and bedsheets
- Laptop with LED projector, screen and audio-visual facility
- Auditorium/hall/space with sitting accommodation for the participants

Inclusion Criteria:

Doctors,Interns, MBBS Students, Staff Nurse, Nursing students, Ayush Doctors, School students and teachers, parents of children with special needs, Scientists, Coast guards, Police (CID), BSF Jawans, Bharat Scouts, Sulabh workers as well as laypersons were included in this study.

According to the educational background and/or professional skills the participants were entitled to respective courses as mentioned above.

Exclusion criteria:

- Children <12 years of age,
- Individuals with any bodily pain or recent major surgery and/or injury that made him/her unfit to provide CPR were excluded.

Duration of training: 2 hours

Participants: Minimum 20 and maximum 200 in each MAP.

Instructors: IAP BLS accredited instructors, 4-6 in number for each MAP

Course fees: Nil

Results

The data thus obtained after conducting courses over 2 years from July 2022 till June 2024 was tabulated and analyzed. 2541 participants including 1109 Health care providers, 487 MBBS students and 1205 non-medical persons were trained in the skills of basic life support.

Table 1. IAP CPR Mass Awareness Programs for Health Care Providers, Sanjeevni

Centre	No. of courses	Participants
Tamralipto Govt. Medical College, Purba Medinipur	1	115
Medical College, Kolkata (Figure 1)	4	285
Golden Jubilee Hall, Kolkata	2	60
Narayana Superspeciality Hospital, Howrah	1	41
IPGMER & SSKM Hospital, Kolkata	1	150
NRS Medical College, Kolkata	1	35
IAP CPR Centre, AIIMS, Kalyani	2	130
Apollo Multispeciality Hospital, Kolkata	1	45
Naihati State General Hospital, 24 PGS(N)	2	37
Fortis Hospital, Anandapur, Kolkata	1	61
Calcutta University Institute Hall, Kolkata	1	150
Total	17	1109

Table2. Hands on training in IAP CPR following e-Sanjeevni

Centre	No. of courses	Participants
Jagannath Gupta Institute of Medical Sciences, Budge budge	1	107
ICARE Institute of Medical Sciences & Research, Haldia	1	120
Total	2	227

Table 3. Non-Medical Persons Certificate Course in IAP CPR

Centre	No. of courses	Participants
IAP CPR Centre, AIIMS, Kalyani	3	150
Tajpur, Purba Medinipur	1	47
Modern High School for Girls, Kolkata	1	61
Variable Energy Cyclotron Centre, Kolkata	1	80
Saha Institute of Nuclear Physics, Kolkata	1	100
Gokhale Memorial Girls' School, Kolkata	1	200
Dhatrigram Balika Vidyalaya, Bardhaman	1	38
Ballygunge Govt School, Kolkata (Figure 2)	1	110
Hindol(NGO), Ruby, Kasba, Kolkata (Figure 3)	2	87
Eastern Railway Hospital, Liluah (Figure 4)	1	85
Samya Foundation, Kolkata	1	92
BJ Block, Salt Lake	1	40
CID, Bhawani Bhawan, Kolkata	1	75
Divine Nursing Home, Kolkata	1	40
Total	17	1205

Table 4. Stakeholders for IAP CPR Mass Awareness Programs

Doctors	160
Interns	62
MBBS Students	487
Staff Nurse	379
Nursing Students	96
Ayush Doctors	150
School Students	384
School Teachers	25
Parents of children with special needs	108
Scientists	182
Coast guards	31
Police officers (CID)	75
BSF Jawans (Figure 5)	60
Bharat Scouts	85
Sulabh Workers	90
Laypersons	167
Total	2541

Discussion:

Achievements in 2022-2024

1. Trained many doctors, MBBS and Nursing students [6], Interns, Nurses & paramedical staff, school teachers and students [7], scientists, office staffs, parents of children with special needs, ambulance drivers, sulabh workers and coast guards and common people thus generating awareness regarding CPR. Table 4.
2. Establishment of IAP CPR Center in AIIMS, Kalyani in July 2022
3. Received CPR manikins from IAP (2 Adult Torso and 2 Infant Prestan) in 2023. Old CPR manikins were replaced.
4. Trained 17 new BLS instructors to strengthen our team
5. Included 4 nursing instructors in CPR training programs
6. Availability of CPR application for use on the mobile device both for training as well as use during the emergency situation.
7. The IAP ALS BLS Group, West Bengal was felicitated for its outstanding work at the 42ndWest Bengal State Pedicon on 10th December 2023.

Challenges faced while conducting the Mass Awareness Programs

1. Hands on training in child CPR is mandatory in Pediatrics curriculum for MBBS students as per NMC guidelines.The Nursing staffs need CPR training for LAQSHYA and MusQan accreditation.With increased awareness regarding the need for CPR training, the number of participants is increasing. Hence,we need to train and involve more instructors to provide for the increasing need.
2. Funds are needed for conducting the MAP,especially for transport to remote and far off places with the manikins and other teaching aids. MAPs are run under IAP charity program and there is no provision for any course fees or sponsorship. Hence, we need financial support from IAP for continuation of this noble initiative to serve the community at large.
3. The online registration of participants needs to be encouraged. Proper documentation of the pretest and post-test scores is necessary. Provision of e-certificates needs to be incorporated along with feedback form.
4. Due to unavailability of electricity in village schools, the power point presentation and videos on CPR could not be displayed but hands on training could be successfully provided on the manikins with live demonstration.
5. Unavailability of audiovisual facility in few courses as they were conducted in open grounds. It was overcome by hands on demonstration of CPR and practice on manikins.
6. Lack of follow up the participants trained in CPR

Plans for 2024

1. Reach the sea beaches with swimming, boating and water sports like diving, parasailing and hilly areas with mountaineering, hiking and paragliding activities and train the local people with skills of basic life support (BLS).
2. To promote and facilitate resuscitation-based research in India.
3. Need to understand the impact of these programs on the participants and the need for

addressing them at frequent intervals to keep them updated and motivated.

4. Establish new CPR Centers in all states.
5. Include new instructors to cater to larger population
6. Spread the CPR awareness to remote areas of West Bengal and beyond.

Figure 1. IAP CPR Mass Awareness Program (Sanjeevni) on 17.07.2023 at Medical College, Kolkata

Figure 2. Non-medical persons certificate course in IAP CPR on 11.10.2023 at Ballygunge Government School, Kolkata

Figure 3. Non-medical persons certificate course in IAP CPR on 17.12.2023 in collaboration with Hindol (NGO), Ruby, Kasba, Kolkata

Figure 4. Non-medical persons certificate course in IAP CPR for Bharat Scouts on 23.07.2023 at Eastern Railway Hospital, Liluah

Figure 5. Non-medical persons certificate course in IAP CPR for BSF Jawans on 13.08.2022 at IAP CPR Centre, AIIMS, Kalyani

Conclusion

Training the common people in the skills of basic life support is the need of the hour so that none of the cardiac arrests goes unattended. Further research is needed to establish the impact of these training activities on non-medical persons and its implication in the real-life situations.

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Follow Up of High Risk Neonate-Practical Tips

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Abstract
Survival of preterm and sick newborns is increasing day by day due to improvements in perinatal care. The vast majority of young adults and children born preterm have good developmental outcome and good quality of life. However improved survival has led to an increased incidence of chronic morbidities and other adverse outcomes. Follow-up of such babies is important in order to reduce mortality, morbidity and to improve the overall outcome. Whilst many of these babies should ideally be followed at a designated high-risk centre often it is the community Paediatrician who is easily available and has to do the needful. All such paediatricians need to be able to assess these babies and refer as required and to advise regarding early simulation, nutrition etc.

Keywords: High Risk Neonate; Follow up; developmental outcome; early stimulation

Introduction

whilesurvival of the high-risk neonate has improved, this has bought its own set of problems and it has been seen the overall incidence of CP has not declined in spite of better care.

These babies may die due to increased susceptibility to intercurrent infections. There is an increased likelihood of developmental delay,motor disabilities, deafness, blindness, cognitive impairment, language, speech and communication problems,learning impairment and behavioural problems such as ADHD, ASD and Depression compared to other newborns. They may require special educational needs. Risks increase with increasing prematurity.

Ideally these babies should be followed up by a multidisciplinary team but often this may not be practical as the family maybe far from such centres. Hence it is important for all paediatricians in the community to have some knowledge of follow-up. Time constraints are often also a big problem in a busy practice hence a methodical approach can save time while picking up babies early for referral.

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Objective of follow up

The ultimate goal can be summarized as:

Reduction of mortality, morbidity and improving outcome.

Keeping this in mind-

- The baby after discharge from hospital should have continuity of care to identify early any abnormality regarding growth and development
- If any such problem is suspected appropriate intervention should be initiated on time
- Parents often need information,support and guidance as they learn to handle these babies
- Parents need encouragement and information regarding early stimulation
- Important parameters to be covered during follow-up include nutrition, growth and development, neurological status and hearing and vision

Identification of High-Risk Babies

There is a need to focus on babies who need maximum attention and adjust according to findings. It is important to understand who is a High-Risk Neonate. A term baby who just spends a few days in NICU for TTN does not require too frequent checkup

but if he/she then shows some other problem such as abnormal tone then a more frequent checkup or even referral may be required. To start with the following babies should be regarded as high-risk

1. Babies <1500g birth weight or gestation <32 weeks
2. Small for date (<3rd centile)
3. Perinatal asphyxia/moderate to severehypoxic ischemic encephalopathy
4. Mechanical ventilation for more than 48 hours
5. Metabolic problems –such as Symptomatic hypoglycemia/blood sugar<25
6. Seizures
7. Infections – meningitis and/or culture positive sepsis/strong suspicion of sepsis although culture negative
8. Shock requiring inotropic/vasopressor support
9. Major morbidities such as chronic lung disease, IVH grade 3 or more, PVL
10. Symptomatic polycythemia
11. Retrovirus positive mother
12. Twin to twin transfusion
13. Hyperbilirubinemia requiring exchange transfusion, resulting in encephalopathy
14. Major malformations
15. Inborn errors of metabolism / other genetic disorders
16. Abnormal neurological examination or neuroimaging at discharge (e.g Hydrocephalus)

Multidisciplinary Team

Newborn follow-up requires many inputs. Often in the peripheral areas many in the team will not be available and certainly not under one roofso the paediatrician needs to be aware of basic aspects of diet, physiotherapy etc so he/she can refer early

- Paediatricians /Neonatologists
- Child psychologist
- Paediatric neurologist
- Ophthalmologist
- Otorhinolaryngologist
- Dietician
- Medical social worker
- Physiotherapist
- Orthopaedic Surgeon
- Speech / occupational therapist

I would like to focus on the

Role ofPaediatricians / Neonatologists

- nodal person needed to coordinate the team
- growth assessment
- screening for developmental delay
- management of intercurrent illness

At the outset it is very important to calculate the gestational age. Apart from immunization most of the examination and advice such as devalopmental and neurological screening as well as early stimulation depend on the corrected gestational age(CGA). Age shoud be corrected until 24 months

- if US in first trimester upto 13 6/7wks is available it is the most accurate method of GA estimation/ confirmation
- From 22 to 27 6/7 wks USG should only be used if the discrepancy with EDD is greater than 14 days.
- Beyond 28 weeks the dating accuracy is much less and should only be considered if the discrepancy is more than 21 days
- For those who have conceived after ART an accurate date can be calculated fom that
- Post-natally Dubowiotz Method or New Ballard Score have been used

Follow-up When to Start?

Pre-Discharge

It is important to start a proper rapport with caregivers prior to discharge. However often due to logistical problems caregivers are often unable to follow-up at the hospital they were managed and so the follow up may have to be done by apaediatrician in the community. An effort should be made to make this transition as seamless as possible. This is the time when parents can be at their most vulnerable. They may have seen their baby go through terrible illness, ventilated, attached to multiple monitors and tubes and are understandably very nervous. Clear-cut advice at this juncture can go a long way in calming parents which will also help in baby care. Some points to be discussed at discharge and first visit, especially if there is a change of venue, include-

- Temperature regulation – proper clothing, cap, socks, Kangaroo mother care etc.
- Feeding – type and amount of milk, method of administration, and nutritional supplementation, if any.
- Prevention of infections – hand washing, avoidance of visitors.
- Physiotherapy and early stimulation.
- Follow-up visits and vaccination
- Danger signs – recognition and where to report if signs are present. (Respiratory rate >60/min, difficulty in breathing, decreased feeding, decreased activity, fever, etc
- ROP screening, if any. Hearing screen

This list is by no means exhaustive and it is important to listen to parental concerns

Post-Discharge

Follow up Schedule

1. Preterm (<32wks OR <1500g)

   First visit within 3-7 days of discharge

   Then every 2 weeks until body weight of 3Kg
2. Infants with other conditions

   First visit within 2 weeks of discharge

   Then best coordinated with the immunization schedule at 6, 10 and 14 weeks

Then for both categories at 3,6,9,12,15,18 months of CGA and then every 6 months until 8 years of age. Ideally should be continued throughout paediatric age as these children may show behavioural changes in the adolescent period.

At any time extra visits should be scheduled if there appears to be any doubts.

Follow up Checklist

(1) Assessment of feeding and dietary counselling:- all visits

Very important to ask leading questions regarding feeds to assess if feeds are given in sufficient amounts. Feeding techniques need to be checked especially if baby is not gaining weight. In such situations watching the baby feed may result in understanding of faulty feeding techniques.

Advice regarding complementary feeds also important. Simple advise about balancing foods and the number and frequency of meals with regard to age can a long way in giving confidence. Weaning is generally done according to chronological (postnatal) age

a) Human Milk Fortifier is usually started prior to discharge and may be continued until baby achieves 2.5Kg or 40 weeks CGA whichever comes earlier

b) Vitamin D 800IU in preterm to be continued till at least one year

c) Calcium should be started as soon as possible if preterm and to continue till 40 weeks CGA

d) Iron from 4 weeks age 2-3mg/Kg/day

e) Multivitamins in exclusively breastfed babies

(2) Medical Examination and Growth monitoring:- All visits

1. Weight, head circumference and length should be checked at every visit. Measurements should be plotted on the growth charts. Fenton growth charts can bedownloaded from the internet and are particularly useful as they go upto 10 weeks PNA (50 weeks CGA) overlapping with the WHO charts. once the preterm infant reaches 40wks CGAthe IAP or WHO charts may be used.
2. Complete physical examination looking for
   (a) Unresolved problems such as chronic lung disease, GERD,
   (b) Any anticipated problems that may have an impact on long term outcomes such as dysmorphisms, neurocutaneous markers.

(3) Immunization:- As per schedule

This is given according to chronological (postnatal) age

(4) Neurological examination

Tone is one of the most fundamental parts of neurological assessment.

From 28-40 weeks muscle tone and motor function develops in a caudocephalic direction followed by relaxation and motor control developing in a cephalocaudal direction for next 12-18 months

1. Neuromotor

   Tone in all peripheral limbs and central tone
2. Neurosensory

   Hearing, vision
3. Neurobehavioural

Arousal pattern, cry, sucking, swallowing

4.Head Growth

Tone

1. Passive Tone-Hypertonia or hypotonia should be looked for by measuring the following angles:

- adductor angle,
- popliteal angle,
- ankle dorsiflexion, and
- scarf sign

using the Amiel-Tison method

2. Active tone
- Spontaneous movement on stimulation

3. Spontaneous posture
- Inspecting while child lies quietly

4. Asymmetry should also be looked for

Pattern of tone Abnormalities

- Diplegia
- Hemiplegia
- Monoplegia
- Quadriplegia

There may be Hypertonia, hypotonia or normal tone

Tight angles atone clinic visit do not always predict poor outcome as they may become normal with time. Persistence of tone abnormalities is more likely to result in poor outcome. The longer the persistence the more significant it is likely to be.

Hammersmith Neonatal and Infant Neurological Examination (HNNE&HINE)

First developed in 1981 HNNE has 34 items, HINE 26 items

HINE 3-24mths age

Proforma for both term and preterm are available online and with practice may be completed in ten minutes

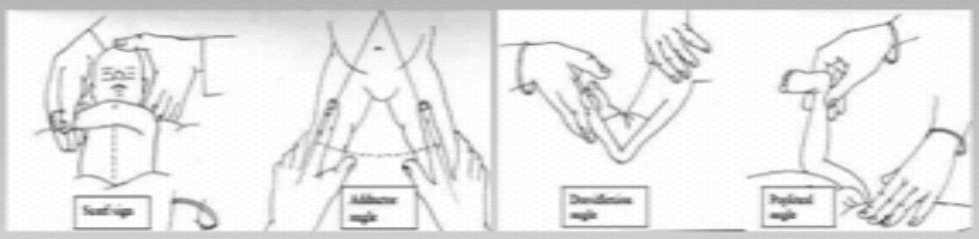
Scoring enables optimal and sub-optimal categories and can be used to predict CP

5) Developmental assessment and DQ frequency of examinationmay be increased any time if there are any concerns

Various development scales which are used commonly are:

1. Development Observation Card (DOC) with CDC grading
2. Trivandrum Developmental Screening Chart (TDSC)

Age (months)	Adductor angle	Popliteal angle	Dorsiflexion angle	Scarf sign
0-3	40° -80°	80° -100°	60° -70°	Elbow does not cross midline
4-6	70° -110°	90° -120°	60° -70°	Elbow crosses midline
7-9	110° -140°	110° -160°	60° -70°	Elbow goes beyond axillary line
10-12	140° -160°	150° -170°	60° -70°	



Amiel-Tison method

3. Denver Development Screening Test (DDST) / Denver II
4. Bayley Scale of Infant Development
5. Development Assessment scale for Indian Infants (DASII)
6. Phatak's Baroda Screening Test

Which scale the paediatrician decides to use depends on multiple factors such as time, training and equipment.

DOC is more suited for well babies rather than high risk babies whilst Bayley, Denver and DASII require longer time and training. Useful in a tertiary centre but difficult to implement by a busy paediatrician in a peripheral setting

Trivandrum Developmental Screening Chart (TDSC)

- TDSC is a simple developmental screening test.
- Initially 17 items taken from Bayley Scale of Infant development.
- The test was used for children 0-2 years age.
- Sensitivity 66.7%
- Specificity 78.8%
- Later modifications include
- 27 items for 0-3 years
- 51 items for 0-6 years
- No kit is required.
- Anybody, including an Anganwadi worker can administer the test.
- Place a scale against age line; the child should pass the item on the left of the age- line.

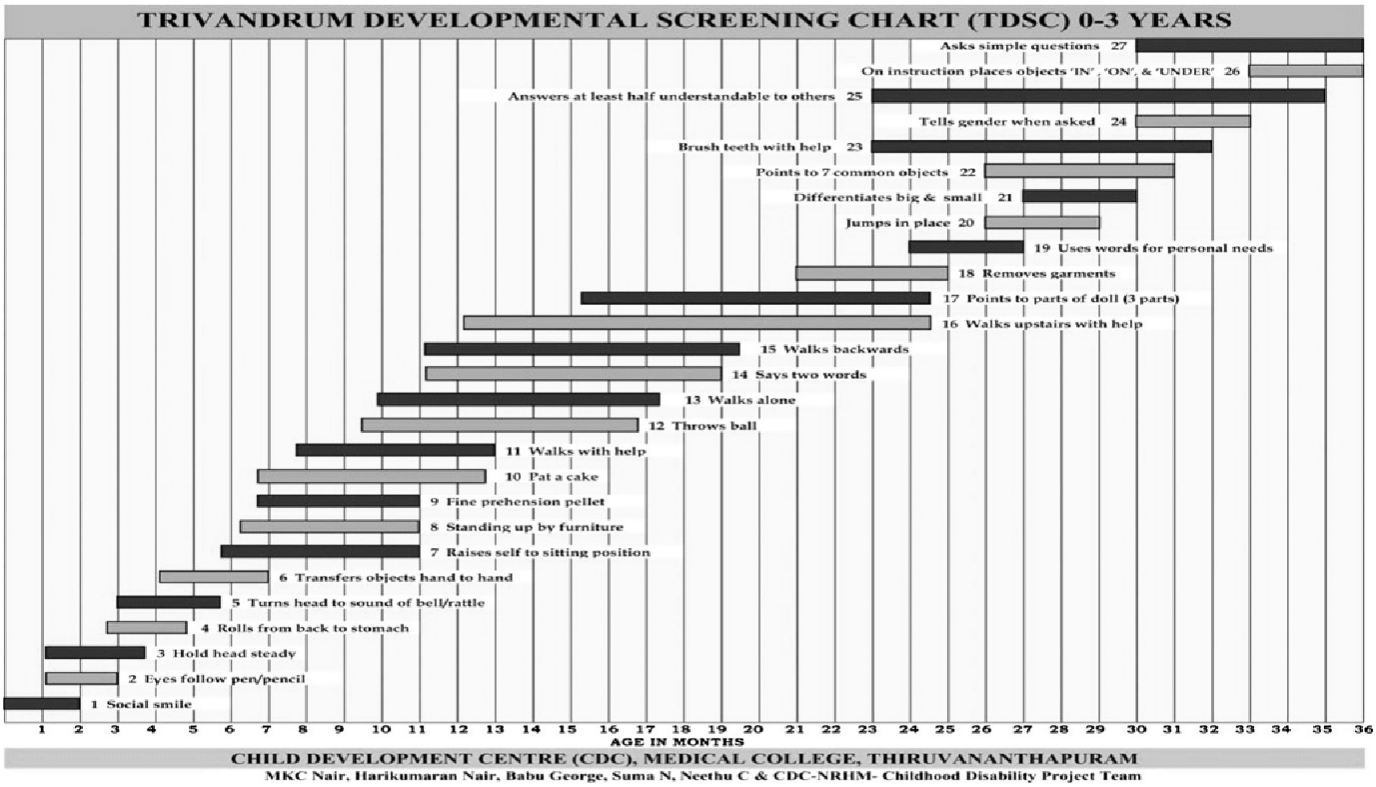
While both the above are screening a more detailed diagnostic assessment should be done at least once at around 3-6 months and repeated at 12 months. DASII is used in many centres in India. HINE is not difficult and all information is free online.

Development Assessment scale for Indian Infants (DASII)

- Age 0-30 mths
- 67 items for assessment of motor development, and 163 items for assessment of mental development.

  Developmental Quotient (DQ) is calculatedfor both motor and mental development
- DQ=developmental age/chronological age
- DQ<70 (<2SD) in either is considered abnormal

6) Hearing (BERA) - between 40 wksCGA and 3 months



7) Ophthalmic evaluation - ROP screening must be done for all babies GA less than 34 weeks. If GA not known then birth weight below 2000g may be taken. More mature babies may also be screened if risk factors present. 1st screen should definitely be done either prior to discharge or latest by 4 weeks PN age whichever is earlier. Screening should continue till maturation of the retinal vessels. Caregivers need to be motivated to make the effort and get screened if they are not in a centre where ophthalmologist is present.

General eye assessment should also be done for all high-risk babies. These babies are especially prone to myopia and strabismus so fixing and following from 3 months and visual acuity at 6 - 9 months are important. It is important to ask for what the parents have noticedand what their concerns are.

8) Neuroimaging

USG: For neonates<32 weeks GA cranial USG to be done by1-2 weeks PNA

MRI brain is indicated in babies with bilirubin encephalopathy,convulsions and HIE

Early stimulation/Enrichment

It is important to keep in mind what is meant by early stimulation. Early stimulation is the set of actions and exercises that aim to develop the child's abilities, whether motor, cognitive or social. Basically, this means stimulating all the senses of the child thereby stimulating development

gross motor

fine motor

personal and social

vision

speechand language

Wherever possible the child has to be encouraged to do active movements by stimulating the senses in an age appropriate manner. One must also keep in mind that all senses are interrelated

For example in the following activity in a 4 month old baby an attempt is made to stimulate all aspects of development.

Caregiver shakes a rattle on one side of the baby while smiling the baby turns towards the rattle and may even try to roll, tries to grab the toy then coos with delight and/or smiles back at the caregiver.

we have stimulated hearing (sound of rattle), gross motor (turning towards rattle), vision (when baby sees the rattle) fine motor (reaching for the rattle) personal/social (smiling and cooing)

It is important to limit screen time. Excessive screen time not only reduces time available for other physical activities and is a risk factor for obesity, it can lead to developmental, behavioural and educational problems. Whilst older recommendation was no screen time till 2 years followed by maximum 1 hour. Video chatting is nowconsidered acceptable below 18months. From 18 to 24 months educational programming with caregiver is permissible.

Instructions to the caregiver have to be tailored to their understanding and while some may understand the principles some just need definite instructions as to what to do at any particular age.

0-4months

- Place your baby's head and neck on the crook of your elbow and forearm while lifting or carrying her.Once there is sufficient head control then baby may be held at the shoulder.
- Show bright coloured objects at 30 cm distance. Encouraging him/her to reach out. Often they are more interested in human face and expressions. Maintain eye contact while talking.
- Encourage movement such as rolling by placing baby on the side and calling from behind.
- Provide different sounds such as music, talking and toys.
- Place on different surfaces, frequently changing position initially but as movement increases allow the baby free movement

4-6months

- Encourage sitting with support
- Continue with auditory stimuli such as music. Encourage movement towards sound
- Give light objects and toys for baby to hold in both hands. Encourage them to reach outfor the objects
- Show moving objects such as pull along toys or balls

- Try to discover what activities your baby enjoys

6-8 months

- Call the child consistently using one name. multiple nicknames simply cause confusion. If the infant responds to the name, smile back as encouragementTalk with the child. Even though (s)he may make no sense respond like a proper conversation
- Keep talking, pointing out names of common objects, toys and household members.
- Use toys to bang and create noise such as drums, rattles or just use everyday household items such as metal spoon and cup
- Play peek-a-boo. Important to show enthusiasm as this encourages participation and interaction
- Encourage more playing in sitting position. Also by placing objects just out of reach try to get baby to crawl.

8-10 months

- Help child stand by holding furniture
- Encourage clapping of hands, banging objects together
- Help in taking out toys from a container and also dropping them back one by one.
- Teach him/her to wave goodbye when someone leaves
- Show picture books. Name objects in the book while pointing at them.

10-15months

- Child should play with other children if possible
- Continue encouraging the child on all aspects expanding on previous learning. For example now with picture books slowly encourage them to point at the object as the caregiver names it. Towards the end of this age period they may even start saying a few names. Let him/her turn the pages.

Conclusion

the follow-up of the high-risk neonate should be initiated prior to discharge. Depending on the anticipated risk of neurodevelopmental problems a schedule for follow-up must be planned and detailed assessment, neuroimaging, ROP screen and hearing screen started according to protocol. This should be seamlessly continued after discharge along with assessment of growth, nutrition, development, neurological status, vision and hearing.

Early stimulation should also be started early in the neonatal unit once baby is stable and certainly before discharge. Any deviation from normal requires timely specific intervention.

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Multiple Jejunoileal Atresia In A Preterm Baby

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Abstract: Multiple jejunal atresia is a rare entity presenting as late onset neonatal feed intolerance and has a male gender predominance. This case report is about a 33 weeker preterm neonate presenting with vomiting and abdominal distension on day one of life after initiation of feeds . Straight X ray abdomen was performed which revealed triple bubble sign of jejunal atresia. Urgent exploratory laparotomy on4th day of life showed 6(six) atretic segments, resection and anastomoses with ileostomy was performed . Baby passed through a turbulent post operative period, discharged on 32nd day of life with weight 1.9 kgs, and on 3 month follow up period his weight was 2.8 kg

Introduction:

Atresia is a congenital defect of a hollow viscus, which results in complete obstruction of the lumen. Intestinal atresia is one of the most frequent causes of bowel obstruction in newborn period. Jejunal atresia is a rare congenital anomaly occurring in 1 in 10,000 live births.(1) Ileal and jejunal atresia are usually described together as jejunoileal atresia JIA [1]. Suggested aetiologies being an antenatal ischemic event causing necrosis and resorption of the involved bowel. Both jejunum and ileum remain highly mobile during their developmental phase, and due to complex anatomy of the vascular arcade supplying the structure, it has potential to get compressed resulting in vascular ischemia.(1)

Case summary:

We report a case of day one male baby born to a gravid 2, para 1 ,non consanguineousmother by vaginal delivery at 33 weeks of gestation, birth weight 2.1kg. with asignificant antenatal history of polyhydramnios.The baby cried at birth but soon after developed mild respiratory distress with Silvermann-alderman score 4/10 with almost normal CXR(Fig 1) for which he received CPAP support.

Orogastric feeds were initiated as the distress settled. Unfortunately, within 24 hours baby developed profuse bilious vomiting and abdominal distension with passage of meconium after 24hrs of life. He was kept nil orally and given IV antibiotics suspecting sepsis with early necrotizing enterocolitis. On examination, the baby had stable respiratory and hemodynamic status with no evident dysmorphic features. Abdominal examination showed symmetrically distended abdomen, hyper tympanic percussion notes with exaggerated bowel sounds. On further evaluation using erect abdominal radiography, classical triple bubble sign (fig.2) was observed suggestive of jejunal atresia. The patient was then scheduled for exploratory laparotomy by Pediatric surgery team. Preoperative optimization was carried out with good hydration, normalization of blood electrolytes, and decompression of the gut by the placement of a nasogastric tube. After a period of initial fluid resuscitation and sepsis control, the patient was taken up for exploratory laparotomy on 4th day of life. He was found to have jejunoileal atresia with multiple, distal atretic segments which falls into the type 1 and 4 category.(Fig 3,4)Complete excision of 6 segments with both ends blind and side to side anastomosis was done with an ileostomy.

Postoperatively, the baby was shifted to the neonatal intensive care unit and was kept on partial parenteral nutrition with intravenous antibiotics.On post-operative day 5 the baby started having ileostomy diarrhea and associated electrolyte abnormalities. Electrolytes correction was given and parenteral nutrition was continued. Availability of ultra small ileostomy bag was difficult which led to skin excoriation at stoma site. This was dealt with twice daily dressing, creating a barrier with gauge and

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topical emollients. Baby had hypoperistaltic bowel with abdominal distension, hence orogastric feeding was slowly established and full feeds were achieved by 24th day of life. Supplemental micronutrients with Vit D3, calcium, MCT oil and B complex was also added with feeds. The complication of ileostomy diarrhea rendered delay in achieving adequate weight gain. Baby was discharged on 32nd day of life with weight 1.9 kgs, and on 3 month follow up period his weight was 2.8 kg.

Discussion:

JIA is one of the important causes of neonatal feed intolerance with male gender preponderance. It is seen to be associated with multiple births, low birthweight, prematurity and polyhydramnios. Cigarette smoking, drug habit, and maternal vasoconstrictor drugs may all contribute to the incidence of atresia.

It is categorized into four types [2, 3]: Type I, where the atresia only includes the mucosa and spares the intestinal wall and mesentery. In Type II, a fibrous cord connects the atretic ends. Type III is characterized by a V-shaped mesenteric gap between the atretic ends. Type III is again subdivided into Types IIIa and IIIb ; IIIa: containing only a mesenteric defect IIIb: known as "Apple peel or Christmas tree deformity" Type IV has multiple atresia throughout the jejunal length.

The principal reason for most of the small intestinal atresia is late intrauterine mesenteric vascular impairment [4,5], which results in segmental infarction and resorption of the fetal intestine leading to atretic sites [6]. Possible causes include intestinal volvulus, intussusception, meconium ileus (cystic fibrosis), strangulating herniation through an abdominal wall defect (gastroschisis / omphalocele). This condition needs to be differentiated from duodenal atresia which presents with early onset symptoms and associated with co- morbidities like Downs syndrome, VACTERL anomaly etc.

The aim of the surgical intervention should be, to restore the continuity of the gastrointestinal tract and maintain the maximum length of the viable bowel [6]Recent study done at JIPMER suggested to undertake multiple anastomoses of the small bowel segments resulting in preservation of gut length with good outcome in the long-term, provided the child can withstand the prolonged operating time [7]. Another study suggested laparoscopic surgeries being with low rate of re-operations, should be considered as preferred option [8]. Post operative period can be turbulent with sepsis and poor gut absorption. A recent study done by J. Shripati et.al [9] revealed that adding prokinetics can minimize gut hypoperistalsis, which plays an important role in providing nutritional support while feeds being established in early post operative days. Parenteral nutrition PN plays a role in providing nutritional support to the patients during the fasting period. However, some studies have pointed out that long-term PN can cause complications such as intestinal mucosal atrophy, cholestatic liver disease, and infection [10]. Therefore, the current mainstream studies about postoperative nutrition management are aimed to establish an early feeding guideline, which can meet the nutritional requirements of life maintenance [11].

Conclusion:

Multiple intestinal atresia is a rare entity presenting with feed intolerance, vomiting and abdominal distension. It could be diagnosed early in antenatal scans to prevent complications leading to reduced morbidity and mortality. Good quality post natal NICU care by medical and surgical team is the only hope for survival.

DECLARATION OF COMPETING INTEREST: No conflict of interest.

CONSENT: Taken.

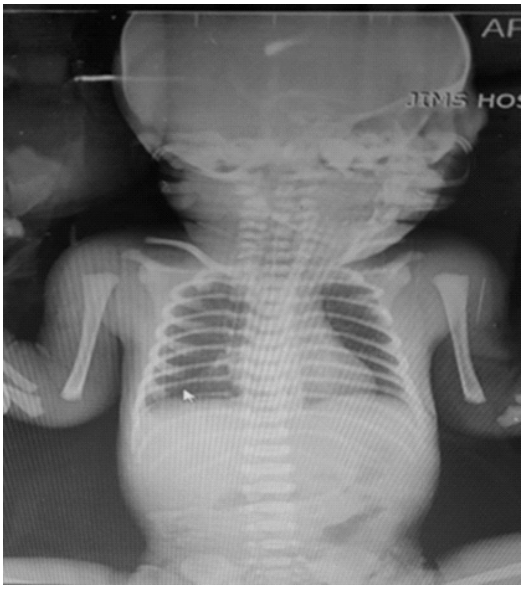

Fig 1: Initial Xray unremarkable

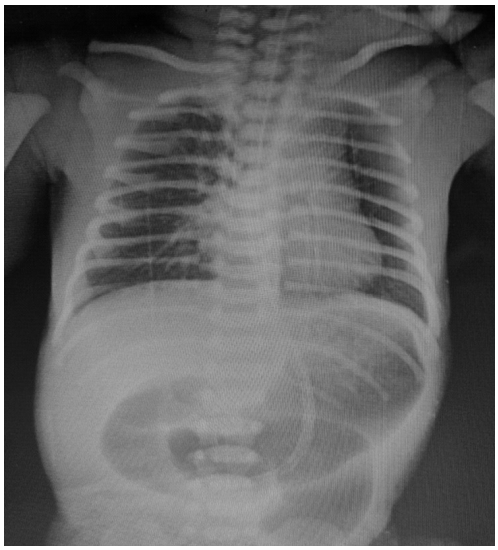

Fig 2: Xray taken after feed initiation showing classical triple bubble sign suggestive of jejunal

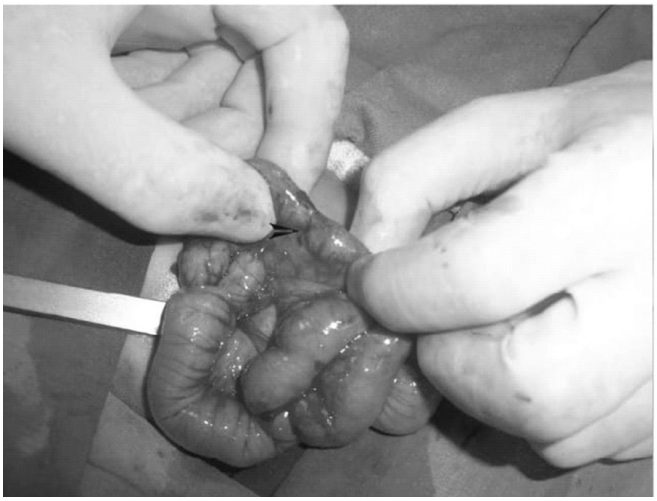

Fig 3: Type 1 atresia at ileal segment

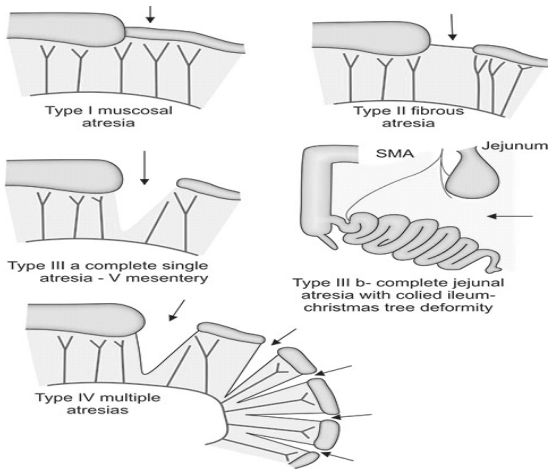

Fig 4: Different types of intestinal atresia.

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Noma Neonatorum: A Less Known Presentation of Known Organism

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Abstract : Noma Neonatorum is manifested as a gangrenous process involving mucocutaneous junctions of oral, nasal and anal area and occasionally, the eyelids and scrotum. It is seen during the first few weeks of neonatal period in premature and low birth weight babies[1]. It is usually associated with Pseudomonas aeruginosa septicemia[2] Except for one large series of 48 babies from Calcutta in 1977, cases of Noma Neonatorum are reported sporadically from different countries[2]. Here, we describe the clinical features, laboratory findings and treatment of the curious case of a 6 day old term baby brought to our SNCU with noma neonatorum.

Keywords :- Noma , Acinetobacter, Pseudomonas, neonate

Introduction

Noma neonatorum is a rare gangrenous disease causing progressive mutilating tissue destruction of soft tissue and bone[3]. In 1978, Ghosal et al[2] described the only case series of 48 premature infants, most of them fatally infected with Pseudomonas aeruginosa presenting with gangrenous lesions similar to noma described in older children. Areas involved were the nose, lips, mouth, and anal region. The age at disease onset was typically during the first 2 weeks. The most frequent pathogen isolated and associated with noma neonatorum is Pseudomonas aeruginosa, usually with a fatal outcome. All cases of neonatal noma had similar characteristics distinct from the older age group of noma patients; hence, they were termed noma neonatorum. Since then, cases of noma neonatorum has been sporadically reported over the years.

Case Report

A 6 day old male neonate, Term gestation, born by caesarean section with birth weight of 2.5 kg, was brought to our hospital with swollen lips and black crust-like lesions on lips, oral mucosa and tongue, along with cheilosis, glossitis and angular stomatitits and areas of denudation and induration over lips, dorsum of tongue and anterior part of palate. Such lesions were not found anywhere else on the baby. On examination baby was dehydrared and hyperthermic with tachycardia and refusal to take feed orally. There was no tachypnea and activity was average with good peripheral circulation with a normal blood pressure for age. Baby was found to have mild polycythemia (Hct=65) with hypernatremia(sodium= 166) as seen on arterial blood gas on admission.

Figure 1 and 2 :- Blackish induated lesions of Noma neonatorum involving lips, tongue and anterior palate

Baby had a history of respiratory distress on day 1 of life, which settled within 24 hours, Subsequently, feeding was established. Later, he developed hyperbilirubinemiason day 4 of life, for which phototherapy was started and given for 72 hours, following which baby started to develop lip swelling, that gradually progressed to black, crusty, tender perioral lesions with bleeding on trial of removal and developed lethargy and refusal to feed simultaneously, following which he was referred to our hospital.

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Here, on admission to SNCU, baby was started on antibiotics, Piperacillin- Tazobactam and Amikacin, with vitamin K for the bleeding. Linezolid was added suspecting a Staphylococcal infection and correction for hypernatremic dehydration was started. Next day, routine blood investigations (Hb= 19, WBC= 13,000 with 68% polymorphs, Platelet= 60,000, CRP=16), coagulation profile(PT=26,INR=2.8) and blood culture was sent. Voriconazole was added for fungal coverage, as per institute protocol.

Baby received Fresh frozen plasma once, for oral bleeding and increased PT,INR. Gram stain and culture of the oral mucosal swab was sent. Both blood culture and oral swab culture revealed Acinetobacter Baumanii complex (sensitive to Ceftriaxone, Gentamicin, Levofloxacin and Tigecycline). Antibiotics were upgraded to Tigecycline according to sensitivity report.

Gradually the coagulation profile and platelet count improved, feeding was established by Ryles tube. Dermatology was consulted, from where it was suspected to be a sepsis induced skin necrosis. CSF study was normal. Baby was given antibiotics for 14 days, which led to complete clearing of the lesion. Baby was able to breast-feed and the mother was confident. Hence the baby was discharged after 14 days.

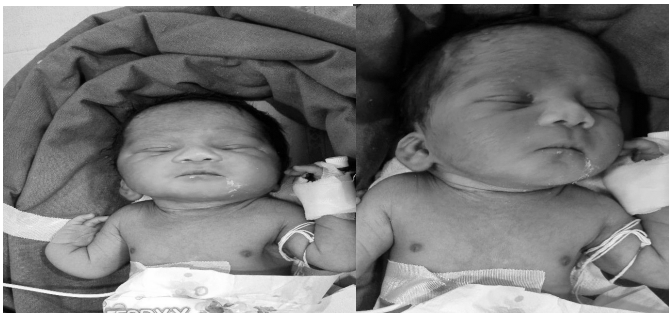

Figure 3 and 4 :- Photos of the baby after healing of lesions from lips and oral mucosa on day 15 of life

Discussion

Noma neonatorum is a distinct entity from Noma (cancrum oris) because it occurs in the first month of life in newborns who are debilitated or immunosuppressed from prematurity or other illnesses. Noma Neonatorum is completely different disease than Noma and is exclusively seen in neonates. It is so called because of the similarity of the facial lesions. However distinct age group, clinical course, microbiology and prognosis make them two separate disease entities[5]. Noma Neonatorum has been linked so much to Pseudomonas infection that some researchers question the distinction between Noma Neonatorum and a neonatal presentation of ecthyma gangrenosum.[4]

Ghosal et al[2], which was the first case series done on Noma Neonatorum and hence, coined this term due to its similarities with Noma in adults. They found that the histopathology of the lesions shows necrosis originating in the perivascular regions of the subcutaneous tissue and extending superficially into the dermis. It is postulated that infection may be the precipitating factor in the causation of gangrene in very sick premature infants with the general and local circulatory inadequacy and poorly developed immune mechanism[1,2]

Over the years, many such cases have been found in different countries, mostly in premature neonates (Osovsky et al[6] in Israel in 2018, Freeman et al[4] in UK in 2002, Parikh et al[7] in Mumbai, India in 2006 and Raimondi et al[8] in Italy in 2014), with some of them in twins. Some cases like Lin et al[9] in China, 1992 and Ganju et al[10] in India, 2020 have been reported in term babies. Most of the cases involved regions other than the face, and unfortunately have had a fatal outcome. Our case was a term baby,with only facial involvement and no features of immounocompromise had been found. Our case had a good outcome with complete resolution of lesion by day 15 of life.

Eisele et al from their series had reported isolation of Klebsiella and Staphylococcus species from cases of Noma neonatorum[11]. Some have reported Citrobacter[6], E coli and Acinetobacter[11] as well. Our present case has reported Acinetobacter from both blood and local site cultures. These reports suggest possible role of common inflammatory mechanism and or bacterial virulence factors, common to certain bacteria, in causation of noma in a critically sick neonate. Noma Neonatorum needs early identification and specific antimicrobial therapy. Despite aggressive treatment with appropriate antibiotics most cases of Noma Neonatorum die. Very few cases have reported survival. Extensive surgical debridement is contraindicated in these cases and reconstructive surgery is advocated after first year of life[12]

Conclusion

Noma neonatorum is a rather lesser known, but largely fatal manifestation of most cpommonly encountered organisms in a hospital. In our case, common neonatal practice was used, including total parenteral nutrition supplementation. The facial involvement, rapid deterioration, and involvement of the deep tissues, including the soft and hard palate, suggested noma neonatorum as the diagnosis. Clinicians should think of this as a differential diagnosis in cases of rapidly developing black ulcerative and indurated lesions covering face. Treatment must be prompt and aggressive, and comprise broad spectrum antibiotics, including coverage for pseudomonas and acinetobacter.

Declaration of patient consent:

All appropriate patient consent forms have been obtained, where patient,s guardians have given their consent for patient's images and other clinical information to be reported in the journal. They have been made aware that their na,mes and initials will not be published and due efforts will be made to conceal their identity but anonymity cannot be guaranteed.

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Conflicts of interest: None

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Acute Paraquat Poisoning Complicated by Acute Kidney Injury A Case Report From Medical College Kolkata

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Introduction

Paraquat herbicide poisoning is a serious medical issue which can cause failure of kidney, lungs, GIT, heart and other organ. Till date there is no specific antidote so it has a very high case fatality rate worldwide. Hence prevention and on exposure aggressive decontamination is necessary. The generation of intracellular reactive oxygen species which result on cellular damage through lipid peroxidation, nuclear factor kappa b activation, mitochondrial damage, apoptosis is primarily responsible for clinical signs of paraquat poisoning[1].

Here we are presenting a case of accidental ingestion of paraquat which was complicated with renal failure and erosive esophagitis with no features of pulmonary toxicity. Patient managed supportively and recovered completely.

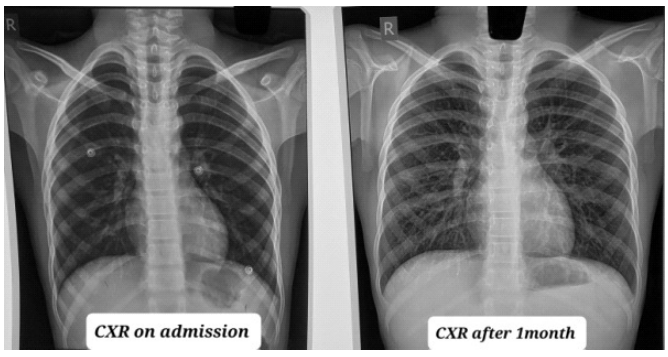
Case Report

A 11 years old male child was brought to emergency with an alleged history of accidental paraquat ingestion 6 hours ago followed by nonprojectile, non-blood-stained vomiting 2 episodes, and gastric lavage in local hospital. On presentation the child was conscious, alert, oriented, Glasgow coma scale 15/15, vitals were stable, no respiratory distress. After 24hrs of ingestion child developed 4 episodes of greenish vomiting and epigastric pain for which he was shifted to paediatric intensive care unit and managed. There was no significant past medical, surgical, drug abuse history.

Baseline investigations revealed normal haematological parameters, electrolytes, and urea creatinine being 24/0.9. Baseline chest xray was also within normal limits. After 48 hrs he developed difficulty in deglutition, raised urea 32 creatinine 1.2. Haemodialysis was initiated immediately and continued for 2 consecutive days. N-acetylcysteine was started at the rate of 10 mg/kg via parenteral route.

On day 5 child developed haematochezia with raised APTT 125 (PT 16.9 INR 1.2). Fresh frozen plasma was transfused henceforth. On day 6 haematochezia continued with rise in urea creatinine. Cryoprecipitate transfusions, inj tranexamic acid given and 3rd cycle haemodialysis was done. On day 8 child again developed high creatinine, hypokalemia and hypocalcemia. Urine output had improved from before.4th cycle of haemodialysis done after which child showed improvement in blood and renal parameters.

On day 14 chest xray was repeated which showed no evidence of fibrosis, and blood biochemistry and electrolytes were within normal limits. On 1wk post discharge follow up child renal functions were within normal limits. On 1month follow up child complained of mild breathlessness on walking. Sp02 in room air was 95 % and child was given a trial of inhaled corticosteroids. Pulmonary function test and upper GI endoscopy is scheduled in near future.



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Clinical Discussion:

This case represents a typical presentation of paraquat poisoning with presenting symptoms of vomiting and epigastric pain. The diagnosis was confirmed with the mother showing the bottle containing the herbicide.

Paraquat causes direct cellular damage by production of superoxide radicals or other reactive oxygen species and nitrite radical[1,2,3]. The target organ for toxicity in individuals who survive the immediate post-ingestion period is the lung, though it causes acute gastrointestinal tract necrosis,erosion of tongue and oral mucosa and multiorgan failure.On clinical classification, there are three levels of intoxication; mild (intake of less than 20 mg of paraquat ion/kg body weight), moderate to severe (20–40 mg), and acute fulminant toxicity (>40 mg). Ingestion of large amounts of liquid concentrate (>50–100 ml of 20% ion weight/volume) results in fulminant organ failure, pulmonary edema, cardiac, renal, and hepatic failure, and convulsions due to CNS involvement[1].

Smaller doses frequently cause toxicity in the kidneys and lungs, the two primary target organs, over the course of the following 2–6 days. Renal failure develops quite rapidly, and creatinine and/or cystatin-C concentrations can be monitored over the first day to detect this group, and these also predict long-term outcomes[1]. The toxins build up in the lung tissue, causing the oxidation of lipids, the production of free radicals, and the depletion of NADPH. This results in diffuse alveolitis, and severe lung fibrosis.In fatal cases of paraquat poisoning, histopathological findings range from pulmonary congestion, edema, and hemorrhage to extensive pulmonary fibrosis[4]. As the kidneys are the main organs responsible for excreting paraquat, individuals exposed to it and with severe acute renal failure have a prolonged half-life of paraquat and a significantly higher mortality rate.[5]

There are not any widely accepted recommendations for treating paraquat poisoning,no specific antidote is available, and the course of treatment can range from supportive care alone to different combinations of immune modulation, antioxidant therapy, hemoperfusion, and hemodialysis [1]. We start with general treatment of poisoning ie.gastric lavage, adsorbents such as activated charcoal (1–2 g/kg) and Fuller's earth (1–2 g/kg). It should be initiated as early as possible to prevent the absorption of the poison[1,2]. Other treatment modalities are hypo-oxygenation, lung radiotherpy, hemodialysis, and hemoperfusion[6]. Steroid treatment may decrease inflammation due to paraquat poisoning. Use of cyclosphosphamide,combined use of methylprednisolone pulse therapy and prolonged dexamethasone therapy can be useful[7,8,9,10]. This says that lung inflammation may be a major factor in patients' potentially fatal hypoxemia, not lung fibrosis. Role of hemoperfusion in patients with acute paraquat poisoning is controversial [11]. Unless there is evident hypoxia, additional oxygen therapy may worsen thing[8,12].

Our patient had initially presented with gastrointestinal features and subsequently developed renal failure requiring haemodialysis. He developed mild respiratory distress after 1month of poisoning, we treated it with inhalational steroid.

This case reportprovides valuable insights regarding the clinical presentation, progression, and management of paraquat poisoning. Initiation of haemodialysis within 48 hours of ingestion was lifesaving in this case. As it is a single case report, we require further larger studies for better understanding of paraquat poisoning.

Conclusion

The fact that paraquat is inherently extreme toxic, and the lack of any effective antidote and treatmentcontribute to its extremely high case fatality rate. The patient may present to the hospital with mild symptoms as in this case, but patient may worsen as time passes. The prognosis of these cases depends on the amount of poison ingested and the time of intervention. So every patient with an alleged history of paraquat poisoning should be admitted, monitored, and managed without any delay.

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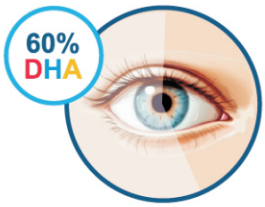

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Alpha-Amylase 100 mg & Papain 50 mg/ 5 ml

Anti-allergic

LM-4 DT Suspension
Levocetirizine 2.5 mg & Montelukast 4 mg
Levocetirizine 2.5 mg & Montelukast 4 mg/ 5 ml

LM-JUNIOR
Levocetirizine 2.5 mg & Montelukast 5 mg
Dispersible Tablets

Wonmont-4
Montelukast 4 mg/ 5 ml **Suspension**

Acid regulation

Lansowon
Lansoprazole 15 mg **Orally Disintegrating Tablets**

WONDER DRUGS

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