Principles of Infant and Toddler Medication Administration In accordance with authority and standards

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Abstract

The principles of drug administration in infants and young children are an important aspect of pediatric clinical practice. Drug administration in this population requires a different approach than in adults, due to differences in pharmacokinetics, pharmacodynamics, and drug tolerance. Clear authority and standards in drug administration in infants and young children are essential to ensure safety and effectiveness of treatment. Quality, evidence-based guidelines are needed to assist health practitioners in choosing the right dose, safe mode of administration, and required monitoring. In this abstract, the importance of understanding the basic principles in administering drugs to infants and young children in accordance with established authorities and standards will be discussed. By paying attention to these factors, it is hoped that treatment in infants and young children can be carried out more effectively and safely, and provide the best health outcomes.

Keywords: Drug Administration, Infants, Toddlers

INTRODUCTION

Child mortality in Indonesia is often found in the neonatal or young infant age. The ratio is 19 per 1000 children dying at neonatal age. Neonatal is a baby aged 1 day - 2 months. At this age, babies are very vulnerable to disease. Once exposed, they will very quickly experience worsening and even death if they do not receive proper and immediate treatment. Various efforts continue to be made in various countries to increase life expectancy in this age range. Starting from WHO, Ministry of Health, and various other child health organizations make guidelines in an effort to increase child life expectancy. In Indonesia itself, the Minister of Health's regulation on Integrated Management of Young Infants or known as IMCI and IMCI has been established.

IMCI stands for Integrated Management of Sick Toddlers or in English called Integrated Management of Childhood Illness (IMCI) is an integrated or integrated approach in the management of sick toddlers with a focus on the overall health of children aged 0-59 months (toddlers). IMCI is not a health program but an approach or way of managing sick toddlers. The concept of the IMCI approach, which was first introduced by the World Health Organization (WHO), is a form of health service strategy aimed at reducing mortality, morbidity and disability of infants and toddlers, as well as increasing health service efforts for children under five.

The degree of health is a reflection of the health of individuals, groups, and communities described by life expectancy, mortality, morbidity, and nutritional status of the community. Health can include a very broad sense, which is not only free from disease but also the achievement of a state of well-being both physical, social and mental.

Based on the description above, the purpose of preparing this paper is to understand and explain the principles of drug administration in infants and toddlers according to the authority and MTBS standards.

DISCUSSION

IMCI stands for Integrated Management of Sick Toddlers or in English called Integrated Management of Childhood Illness (IMCI) is an integrated or integrated approach in the management of sick toddlers with a focus on the overall health of children aged 0-5 years (toddlers). IMCI is not a health program but an approach or way of managing sick toddlers. IMCI is a designated effort to reduce morbidity and mortality while improving the quality of health services for children under five in basic health outpatient units such as puskesmas, pustu, polindes poskesdes and others.

IMCI is an integrated approach in the management of sick toddlers who come to primary health care outpatient facilities which includes curative efforts against pneumonia, diarrhea, measles, malaria, malnutrition. IMCI is an approach to sick children under five that is carried out in an integrated manner by combining promotion, prevention and treatment services for the five main diseases that kill infants and children under five in developing countries, namely pneumonia, diarrhea, measles, malaria and malnutrition.

IMCI is an approach initiated by WHO and UNICEF to prepare health workers to assess, classify and provide action to children for common life-threatening diseases.

1. **Principles of appropriate drug administration in infants and young children**

    a. Preparing and giving medicine to children should be done in the light. This is to avoid the risk of misadministration or incorrect dosage.
    b. Know the name, contents and purpose of the medicine.
    c. Before and after giving the medicine, read the package label first.
    d. The purpose is so that the dose when giving it is correct and afterward can be more vigilant if an error occurs in giving it. So that you can immediately consult a doctor for the best course of action.
    e. See the expiration date
    f. Take the medicine according to the dose:
        - Observe the correct dosage according to the baby's weight or age.
        - When taking ½ tablet split the tablet into two equal parts
        - Use an appropriately measured medicine measuring spoon
    g. Never tell your child to take their own medicine.
    h. Pay attention to how the medicine is stored
    i. Pay attention to the instructions on how to use the medicine
    j. Some medicines can be taken together and some cannot.
    k. Avoid mixing puffer medicine with syrup medicine
    l. Mixing medicine with sweeteners

m. Do not mix medicine with fruit juice
n. Pay attention when mixing medicine with milk
o. Avoid prohibited activities while using the medicine
p. Pay attention to the side effects of using the medicine and how to deal with them
q. During the medication period, do not take other medications without the doctor's knowledge.
r. The period of medication should be known

In infants and children under two years of age:

a. Carry or hold the baby
b. Ask others to help calm him/her down so that medication administration can be done properly
c. If no one else is available, wrap the baby in a blanket so that he/she does not struggle when the medicine is given
d. Forcing the baby to take medicine will only cause trauma

Seven correct drug administration

a. Correct patient
b. Correct drug
c. Correct dosage
d. Correct time
e. Correct route
f. Correct information
g. Correct response
h. Documentation

1. Various therapies according to the disease

Question:	SEE and HEAR:	Need IMMEDIATE handling
• Can the child drink or breastfeed? • Does the child regurgitate all food and/or drink? • Has the child had any seizures during this illness?	• Is the child fussy or restless, lethargic or unconscious? • Is the child having seizures at this time? • Is stridor* heard? • Does the child appear blue (cyanosis)? • Are the hands and feet pale and cold?	

Table 1. Checking for common red flags

SYMPTOMS	CLASSIFICATION	ACTION/TREATMENT
One or more of the following signs are present: • Unable to drink or breastfeed. • Spits out all food and/or drink • Has had or is having seizures • Fussy or restless. • Lethargic or unconscious • Has stridor • Looks blue (cyanosis) The tips of hands and feet are pale and cold	VERY SEVERE DISEASE	• If there is a seizure give diazepam • If there is stridor, make sure there is no airway obstruction. • If there is stridor, cyanosis, and pale and cold hands and feet, give oxygen. • Prevent blood sugar from dropping • Keep the child warm • VISIT IMMEDIATELY
• - Inward pull of the chest wall OR • Oxygen saturation < 90%	SEVERE PNEUMONIA	• Give oxygen up to 2-3 liters per minute • Give first dose of appropriate antibiotic REACH OUT IMMEDIATELY*
• Rapid breathing	PNEUMONIA	• Give Amoxicillin 2x a day for 3 hours ** • Give throat lozenges and safe cough suppressants • Treat wheezing if present • If cough > 14 days or wheezing recurs, EXECUTE for follow-up examination • Advise when to return soon • 3-day repeat visit
• No signs of severe pneumonia or pneumonia	COUGH NOT PNEUMONIA	• Give throat lozenges and safe cough suppressants • Treat wheezing if present • If cough > 14 days or wheezing recurs, ADVANCE for follow-up examination • Advise when to return soon • Re-visit 5 days if no improvement

Two or more of the following signs are present: • Lethargic or unconscious • Sunken eyes. • Unable or unwilling to drink. • Abdominal skin pinch returns very slowly.	SEVERE DEHYDRATION DIARRHEA	• If no other severe classification : Give fluids for severe dehydration and Zinc tablets as per therapy plan C. • If the child also has another severe classification : a. RETURN IMMEDIATELY b. If still able to drink, give breast milk and ORS solution during the journey. • If the child is >2 years old and there is cholera in the area, give antibiotics for cholera.
Two or more of the following signs are present: • Restlessness, fussiness / irritability. • Sunken eyes. • Thirsty, drinks voraciously. • Slow return of abdominal skin pinch	MILD/MODERATE DEHYDRATION DIARRHEA	• Give fluids, Zinc tablets and food as per Treatment Plan B • If other weight classifications are present: a. IMMEDIATE RETURN to hospital\If still able to drink, give breast milk and ORS during the journey. • Advise when to return immediately. • Revisit in 3 days if there is no improvement.
• Not enough signs to classify as severe or mild/moderate dehydration diarrhea.	DIARRHEA WITHOUT DEHYDRATION	• Give fluids, Zinc tablets and food as per Therapy Plan A. • Advise when to return immediately. • Revisit in 3 days if there is no improvement.
• With dehydration.	SEVERE PERSISTENT DIARRHEA	• Manage dehydration before referral, unless there is another severe classification. • MEET
• No dehydration.	PERSISTENT DIARRHEA	• Advice on feeding for persistent diarrhea. • Give zinc tablets for 10 consecutive days • 3-day repeat visit.

• There is blood in the stool	DISENTRI	• Give appropriate antibiotics • Give zinc tablets for 10 consecutive days • Advise when to return soon. • 3-day repeat visit.
• Any danger signs OR • Sitting stiffness	SEVERE ILLNESS WITH FEVER	• Give first dose of injectable artemeter or injectable kinin for severe malaria • Give first dose of appropriate antibiotic Prevent blood sugar from dropping • Give one dose of paracetamol for fever ≥ 38.5°C IMMEDIATE REACH
• Fever (on history taking or palpable heat or temperature ≥ 37.5°C AND • Microscopic RDT positive	MALARIA	• Give first choice oral anti-malarial drug • Give one dose of paracetamol for fever ≥ 38.5°C • Advise mother when to return soon Re-visit 3 days if fever persists • If fever persists for more than 7 days, RE-visit for further assessment.
• RDT negative, OR • Other causes of fever found	FEVER MAY NOT BE MALARIA	• Give one dose of paracetamol for fever ≥ 38.5°C • Give appropriate antibiotics for other causes of fever found • Advise mother when to return • Revisit in 3 days if fever persists • If fever persists for more than 7 days, RE-visit for further assessment
• There are general red flags OR • Nervousness	HEAVY DISEASE BY FEVER	• Give the first dose of appropriate antibiotics • Prevent blood sugar from dropping • Give one dose of paracetamol for fever ≥ 38.5°C • VISIT IMMEDIATELY
• No general red flags AND • No rigidity	FEVER NOT MALARIA	• Give one dose of paracetamol for fever ≥ 38.5°C

		• Give appropriate antibiotics for other causes of fever found • Advise mother when to return • Revisit 2 days if fever persists • If fever persists for more than 7 days, RE-visit for further assessment
• There are general danger signs OR • There is opacification of the cornea of the eye OR • There are deep or extensive mouth sores	IMPACT BY COMPLICATIONS SEVERE****	• Give vitamin A treatment dose • Give the first dose of an appropriate antibiotic • If there is corneal opacification or pus in the eye give tetracycline eye ointment • If fever is high (≥ 38.5°C) give first dose of paracetamol • IMMEDIATE VISIT
• Pus in the eye, OR • Mouth sores	MEASLES WITH COMPLICATIONS IN THE EYE AND/OR MOUTH	• Give a treatment dose of vitamin A • If there is pus in the eye, give antibiotic eye ointment • If there are sores in the mouth, apply mouth antiseptic. • If the child is malnourished give vitamin A according to the dose. • Re-visit in 3 days
• Measles now or in the last 3 months	CAMPAK	• Give vitamin A
• There are signs of shock or agitation OR • Vomiting with blood/coffee-like substance OR • Black-colored stools OR • Bleeding from nose or gums OR • Bleeding spots on the skin (petechiae) and positive tourniquet test • OR • Frequent vomiting	DENGUE HEMORRHAGIC FEVER (DBD)	• If there is shock, give oxygen 2-4 liters/minute and give intravenous fluids immediately as directed. • If there is no shock but frequent vomiting or unwillingness to drink, give Ringer lactate/Ringer acetate intravenous fluids, the amount of intravenous fluids as directed. • If there is no shock, no vomiting and still willing to drink, give ORS or other fluids as much as possible on the way to the hospital

		• Give first dose of paracetamol, if fever is high (≥ 38.5°C), salicylates and ibuprofen are not allowed • IMMEDIATE HOSPITAL
• Sudden and persistent high fever OR • Heartburn or restlessness OR • Bleeding spots on the skin and tourniquet test (-)	MAYBE DHF	• Give first dose of paracetamol, if fever is high (≥ 38.5°C), no salicylates and ibuprofen • Advise to drink more: ORS/other fluids. • Advise when to return soon • Re-visit 1 day if fever persists
• None of the above symptoms	FEVER MAY NOT BE DBD	• Treat other causes of fever • Give first dose of paracetamol, if fever is high (≥ 38.5°C), exclude salicylates and ibuprofen • Advise when to return immediately • Revisit 2 days if fever persists
• Painful swelling behind the ear	MASTOIDITIS	• Give the first dose of appropriate antibiotics • Give the first dose of paracetamol for pain management • VISIT IMMEDIATELY
• Ear pain, OR	INFECTION ACUTE EAR INFECTION	• Give appropriate antibiotics for 5 days • Give paracetamol for pain • Dry the ear with absorbent material after washing with 3% H2O2 • Re-visit in 5 days

• Fullness in the ear and may discharge from the ear for less than 14 days	INFECTION EAR CHRONIC	• Dry the ear with absorbent cloth/paper after washing with 3% H2O2 • Give appropriate ear drops Re-visit 5 days
• No ear pain AND no pus coming out of the ear	NO INFECTION EAR	• No need for additional measures
• Looking very thin OR • Edema on both legs OR • BW (TB) < - 3 SD OR LILA < 11.5 cm AND one of : a. there are general danger signs or b. there is a severe classification or • there is a breastfeeding problem	MALNUTRITION WITH COMPLICATIONS	• Beri dosis pertama antibiotik yang sesuai • Tangani anak untuk mencegah turunnya kadar gula darah • Hangatkan badan • RUJUK SEGERA
• Looks very thin • Minimal edema (both backs of hands/feet) or no visible edema • BW/BW (TB) < - 3 SD OR LILA < 11.5 cm AND no medical complications	UNCOMPLICATED MALNUTRITION	• Give appropriate antibiotics for 5 days • Manage the child to prevent blood sugar levels from dropping • Warm the body • Provide nutritional rehabilitation / recovery food according to the needs of malnourished children, namely 150-220 kcal / kgBB / hr, 4-6 g / kgBB / hr protein • Check for possible comorbidities (e.g. TB, malaria, HIV, worms, etc.) • Advise when to return immediately • 7-day re-visit

• BB/PB (TB) ≥ - 3 SD - < - 2 SD ATAU LiLA antara 11,5 cm - <12,5 cm	LACK OF NUTRITION	• Conduct a Feeding Assessment on the child and counsel according to the "Feeding Recommendations for Healthy and Sick Children". If there are feeding problems, revisit in 7 days. • Assess for possible TB infection. • 30-day repeat visit.
• BB/PB (TB) between - 2 SD - + 2 SD OR LiLA ≥ 12.5 cm	GOOD NUTRITION	• If the child is less than 2 years old, conduct a feeding assessment and counsel according to the "Eating recommendations for healthy and sick children." If there are feeding problems revisit at 7 days.
• Palms are very pale	SEVERE ANEMIA	• If still breastfeeding, continue breastfeeding • REACH OUT IMMEDIATELY
• Palms are slightly pale	ANEMIA	• Conduct a Feeding Assessment on the child. If there is a problem, provide feeding counseling and 7-day revisit • Give iron • Give deworming medication if the child is ≥ 1 year old and has not received medication in the last 6 months • If Malaria High Risk area: give oral antimalarials • Advise when to return soon • 14-day repeat visit
• No sign of paleness found on the palm of the hand	NO ANEMIA	• If the child is < 2 years old, assess the child's feeding. If there is a feeding problem, 7-day revisit
Children aged 18 months and above and HIV Positive Tests	CONFIRMED HIV INFECTION	Refer to Health Center/ ARV Referral Hospital

Child < 18 months of age and tests HIV Positive, OR HIV positive mother and HIV negative child who was breastfed for less than 6 weeks prior to the child's HIV test, OR HIV positive mother and unknown HIV status of the child	HIV EXPOSURE	
Child less than 18 months of age tests HIV positive AND has one of the Severe IMCI classifications (other than DHF, Measles with severe complications and Mastoiditis) Positive OR Child less than 18 months of age tests HIV positive AND has white patches in the mouth accompanied by a history of HIV-related maternal death or HIV positive mother with severe clinical symptoms.	ALLEGEDLY INFECTED WITH HIV	
Child tests HIV negative OR Mother tests HIV negative	LIKELY NOT AN INFECTION HIV	Treat existing Infections

CONCLUSION

IMCI is an integrated approach in the management of sick toddlers who come for treatment at basic health service outpatient facilities which includes curative efforts against pneumonia, diarrhea, measles, malaria, malnutrition. IMCI is not a health program but an approach or way of managing sick children under five. IMCI is a designated effort to reduce morbidity and mortality while improving the quality of health services for children under five in basic health outpatient units such as puskesmas, pustu, polindes poskesdes and others. Administering medicine to infants and young children can be troublesome. Often infants and toddlers refuse and cry when taking medicine or using their medicine. To overcome these problems, among others, is to use tips and tricks for giving medicine to infants and toddlers and still adhere to the 7 principles of correct drug administration.

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