INA-RESPOND

INDONESIA RESEARCH PARTNERSHIP ON INFECTIOUS DISEASE

KEMENTERIAN KESEHATAN REPUBLIK INDONESIA

NEWSLETTER

December 2019

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NATIONAL INSTITUTE OF HEALTH RESEARCH AND DEVELOPMENT
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INA-RESPOND Newsletter

TRIPOD & INA-PROACTIVE Study Updates

By: Eka Windari R., Lois E. Bang, Maria Intan Josi, M. Ikhsan Jufri, Venty Muliana Sari

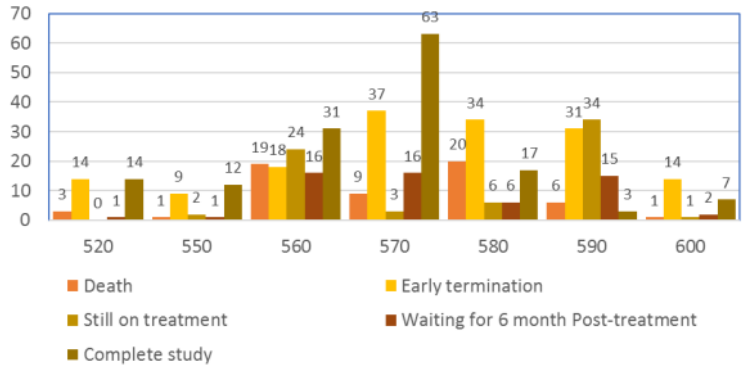

Figure 1.Participant status per site based on uploaded CRF per 30 Nov 2019

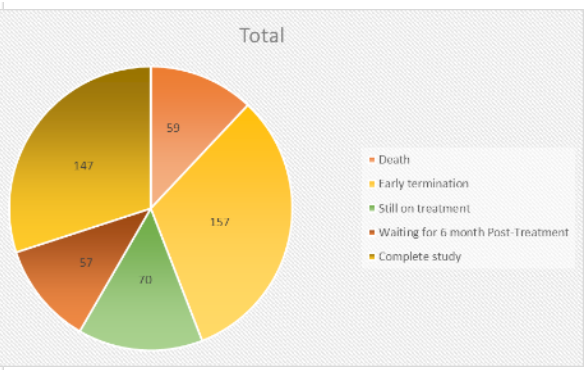

Figure 2. Total Participants Status based on uploaded CRF per 30 Nov 2019

STUDY UPDATES

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PARTICIPANT STATUS

Per 31 November 2019, the total ongoing participants in TRIPOD study are 127 out of 490 enrolled participants. From those 127 ongoing participants, 70 are still on TB treatment while 57 are waiting for 6-month post-treatment visit. One hundred forty seven participants have completed the study while 216 participants are terminated early (including death). Therefore, there are still 25.9% participants from the total enrolled participants in the follow-up status. From the uploaded CRFs, there are one participants from site 520 (RS Sanglah Denpasar) who still need to be followed up, three participants from site 550 (RSUP dr. Wahidin Sudirohusodo Makassar), 40 participants from site 560 (RSUP dr. Kariadi Semarang), 19 participants from site 570 (RSUD dr. Soetomo Surabaya), 12 participants from site 580 (RSUP dr. Sardjito Jogjakarta), 49 participants from site 590 (RSUP Persahabatan Jakarta), and three participants from site 600 (RSUP dr. Adam Malik Medan).

AWAITING CULTURE AND DST RESULT

The result for baseline culture and DST from all sites is complete. However, we are still waiting for the DST line 2 and the culture isolate date from 9 subjects).

Site	Waiting for Baseline Study Culture Result	Waiting for Baseline DST Result
520 (n=32)	Complete	Complete
550 (n=25)	Complete	Complete
560 (n=108)	Complete	Complete (still waiting for DST line 2 result and culture isolate date from 9 subjects)
570 (n=128)	Complete	Complete
580 (n=83)	Complete	Complete
590 (n=89)	Complete	Complete
600 (n=25)	Complete	Complete

Figure 3.Culture and DST results up to 31 July 2019

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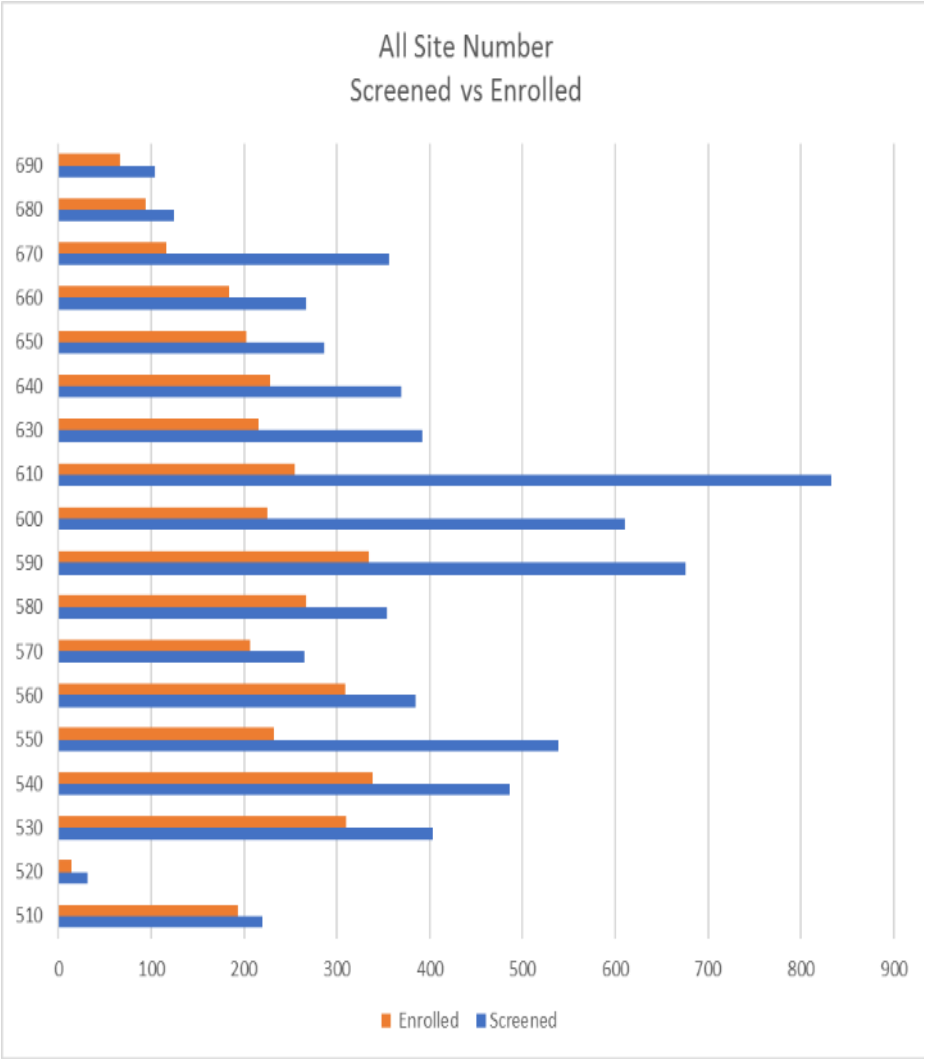
On 5 November 2019, Site 520 (RSUP Sanglah, Denpasar, Bali) was activated as the INA-PROACTIVE 19th site. Currently, there are seven actively-recruiting sites. Soon, four sites will end their subject enrollment activities. They are Site 510 (RSUP Hasan Sadikin, Bandung), Site 540 (RSPI Sulianti Saroso), Site 670 (RSUD Dr. Zainoel Abidin, Aceh) and Site 680 (RSUD Dr. Soedarso, Pontianak). By December 8, 2019, 3,985 participants (172 pediatrics and 3,813 adults) had been enrolled from a total of 6,805 screened subjects. Total of screened and enrolled subject from each Site shown in the figure below:



Seventy-seven study participants met their end-of-study due to mortality, withdrawn consent, or change of domicile. Details of end-of-study distribution per site is shown in the table on the right.

The following are updates related to INA-PROACTIVE site visits within this last month:

- 3rd Site Monitoring Visit for site 640 (RS St. Carolus) on Dec 2-5, 2019.
- 1st Site Monitoring Visit for site 520 (RSUP Sanglah) on Dec 3-4, 2019.

INA104's first Endpoint Review Committee (ERC) meeting was conducted at NIHRD on December 16-17, 2019. The meeting was opened by Dr. dr. Irmansyah, Sp.KJ(K), Director of Centre for Research and Development of Health Resources and Services. The objective of the meeting is to confirm that an event has taken place and that each event fulfills the protocol definitions. The events include mortality incidents and morbidity of interest occurring after the provision of informed consent, which include AIDS-related and serious non-AIDS related events detailed further in this document. The outcome of endpoint reporting should be to satisfy criteria consistent with 'confirmed' or 'presumptive' diagnosis following review. The next INA-PROACTIVE nearest agenda is Statistical Analysis Plan (SAP) meeting that has been scheduled on January 23-24, 2020.

Site Number	Subject		Total End Of Study	Total Existing Subject
	Total Screened	Total Enrolled		
510	220	193	0	**193**
520	31	14	0	**14**
530	403	310	6	**304**
540	222	164	0	**164**
550	712	337	13	**324**
560	306	230	7	**223**
570	372	313	2	**311**
580	295	220	0	**220**
590	336	249	18	**231**
600	795	338	11	**327**
610	950	327	12	**315**
630	466	245	1	**244**
640	380	225	0	**225**
650	310	229	4	**225**
660	317	222	1	**221**
670	356	116	0	**116**
680	125	94	0	**94**
690	104	66	1	**65**
700	105	93	1	**92**
Grand Total	**6805**	**3985**	**77**	**3908**

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SITE 510: HASAN SADIKIN HOSPITAL, BANDUNG

By: Syndi Nurmawati

SITE PROFILE

Bandung, also called Parijs van Java, is a city surrounded by mountains, including Tangkuban Perahu. Although it is an active volcano which recently erupted, Bandung is still one of tourists' favorite destination due to its cold weather and beautiful scenery. Its biggest hospital is Hasan Sadikin, located near Paris Van Java Mall. Well known as Rancabadak hospital by local people, it was established in 1923 under the name Het Algemeene Bandoengche Ziekenhuis. On its 96th year, Hasan Sadikin has developed from only having 300 beds into a top referral hospital for West Java with almost 1,000 beds. It is also a teaching hospital for medical students from Padjadjaran University and several nursing faculties.

Faculty of Medicine Padjadjaran University and Hasan Sadikin Hospital have been actively conducting researches supported by several research centers. Clinical Infectious Disease Research Center, headed by Bachti Alisjahbana, focuses on studies in tuberculosis, HIV, and the general infectious disease areas. It has collaborated with many hospitals and research institutes in Indonesia as well as foreign countries to build better research capacity and make an impact in improving the prevention, diagnosis, and management of diseases in Indonesia. Since 2013, the research center has collaborated with INA-RESPOND through AFIRE study (The Etiology of Acute Febrile Illness causing Hospitalization), which is a large observational cohort study concentrating on finding etiology in patients hospitalized due to fever. Its next large cohort is the PROACTIVE study, which will still enroll patients until the end of December 2019.

Bachti Alisjahbana, a Steering Committee member, is an internist and a brilliant researcher with a lot of publications, both national and international. Although he is often seen bustling through the day attending meetings in many places, he will always find time to do kayaking.

Principal Investigator for Proactive study is Rudi Wisaksana. This internist is a Ph.D. graduated from Nijmegen University. He is very active in the HIV area, with a lot of research under his belt. His love for traveling and black coffee is unquenchable.

Picture 1. dr. Bachti Alisjahbana, SpPD-KPTI, PhD

Like our PI, one of our CoPIs also loves to travel. Agnes Rengga Indrati Ariantana is a clinical pathology specialist at Hasan Sadikin Hospital. She is very detail-oriented and concerned about laboratory results. She also has an interest in gardening.

Children love our next CoPI. Anggraini Alam, a pediatric specialist, has recently graduated as Ph.D. from Padjadjaran University. She is very gentle and calm but also very thorough in examining patients and writing articles. Watching comedy is her hobby.

Picture 2. *from left to right* Yusak Sastraatmaja, Dewi Pratiwi Hasriyadhi, Nurul Hidayah Chairunnisa, Hofiya Djauhari, Anggraini Alam, Agnes Rengga Indrati Ariantana, Rudi Wisaksana, Syndi Nurmawati, Fitria Utami, Dwi Febni R, Sigit Sunarko.

There are three research assistants at site 510; one of them is Syndi Nurmawati. This DTM&H alumnus joined INA-RESPOND at the start of the AFIRE study in 2014. When not in front of research documents and computers, her favorite pastime is reading mystery thriller books, especially the ones written by Agatha Christie and David Baldacci.

Our next research assistant came from Bogor just for the PROACTIVE study. Graduated from Lampung University, Nurul Hidayah Chairunnisa is a sweet, calm, and shy girl, to people who just met her. However, after working together for more than a year, she transforms into a cheerful girl. Whenever she feels pressured, this Hufflepuff team member turned to chocolate as her stress reliever.

Our newest research assistant is Dewi Pratiwi Hasriyadhi. She joined our team late September 2019 and has since been gradually learning to become a great researcher. This fresh graduate nurse loves to watch Korean drama. Even though she is the youngest member of the team, she does not hesitate to make spontaneous and witty comments that bring laughter to others.

Our study nurse also worked as a nurse in the HIV clinic in Bandung, making him the perfect connection between the research team and patients. Sigit Sunarko is a tall and big man, making him noticeable even from a distance. Although his appearance seems scary, he is a funny and kind person once we work together.

Hofiya Djauhari handles sample processing, storage, and shipment. She graduated from Bandung Institute of Technology and has been involved in many studies ever since, including the AFIRE research. Her conscientious nature fits her perfectly for her job at INA-RESPOND. She loves to watch Keanu Reeves's movies while eating sushi.

The sample collection is Octavia Kartika Dwi's expertise. She is very patient, especially to children and difficult patients. This firstborn is also very dedicated to his work, always wakes up at 3 am, does all the house chores, and leaves for work at 5 am every day.

For some members of our team, research is a new world with lots of new experiences. However, they enjoyed it immensely. "Writing articles and collecting data with high accuracy is some things that we never experience in our classes," our research assistants said. Moreover, in collecting data, they also have developed closeness with patients. Some patients tell them every time they came for a regular check-up, even though it's not their time for study follow up. Some patients also call our RAs in the middle of the night to talk about their problems at home.

In Bandung, the PROACTIVE team is not limited to the names mentioned above. We also had a lot of help from the laboratory, secretariat, and finance team, including in correspondence and finance reports. Although we are unable to mention their names one by one, their help is priceless.

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REPORT

By: Prof. Pratiwi Sudarmono, PhD, SpMK(K)

Developing Clinical Research Networks to Support Emergency Preparedness and Response in Resource-Limited Environments

Prof Pratiwi Sudarmono, accompanied by Prof Tuti Parwati and Herman Kosasih, attended a half-day symposium at the US-NIAID campus on November 19, 2019, and American Society of Tropical Medicine and Hygiene (ASTMH) annual meeting from November 20-24, 2019. During these two meetings, Prof Pratiwi gave a presentation on INA-RESPOND, covering the reasons behind the establishment of INA-RESPOND, its structure and governance, how INA-RESPOND complements existing healthcare structures, and how INA-RESPOND enhances the research capacities at the main office as well as on study sites, from study preparation, data collection and management, monitoring, laboratory examination, and publication. The presentation also discussed INA-RESPOND's accomplishment, how INA-RESPOND can be utilized if outbreaks occur in Indonesia, and how INA-RESPOND would like to expand its collaboration in the future.

During these symposia, representatives from other networks also described their activities and achievements. Justino Regaldo-Pineda MD presented La-Red, which is a Mexico Emerging Infectious Diseases Clinical Research Network; Moses Massaquoi presented the prospects and challenges of Sub-Regional Collaboration in West Africa on Clinical Research; while Seydou Doumbia, MD shared their experience on Collaborative Clinical Research and Outbreak Preparedness in Mali and described building clinical research capacity and strengthening outbreak preparedness in Guinea through the PREGUI (Partnership of Clinical Research in Guinea).

During these symposia, we learned how these clinical research networks, which have different structures approaches and activities, complement general public health systems and can be leveraged in emergency preparedness and outbreak response. Also, these networks invite future collaborators to be engaged in future research activities.

Thank you to dr. Aaron Neal for planning, organizing, and arranging the meetings. We would not have a productive time in the events if it were not because of your full co-operation.

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MY SWEET MAJESTY, HOW SHALL I AVOID THEE?

By: Aly Diana

During the ancient history, people considered "all carbohydrates are the same" and should be classified chemically as "simple" and "complex." In the 1970s, Jenkins and colleagues introduced a new classification for dietary carbohydrates called the glycemic index (GI), after conducting a series of controlled feeding trials. GI challenged the conventional belief by showing that different chemical or physical forms of "complex carbohydrates" produce substantially different postprandial glycemic responses.

After that, the term GI becomes pretty popular and widely adopted. GI is defined as the incremental increase in postprandial blood glucose following the ingestion of a specific amount of carbohydrate from particular food compared with ingestion of the same amount from a standard carbohydrate source (e.g., glucose). The GI assigns a numeric score to a food based on how drastically it makes our blood sugar rises after the ingestion of certain foods. Foods are ranked on a scale of 0 to 100, with pure glucose (sugar) given a value of 100. The lower a food's glycemic index, the slower blood sugar rises after eating that food. In general, the more processed a food is, the higher its GI; and the more fiber or fat in a meal, the lower its GI.

However, the physiological response in our body to any carbohydrate-containing food or meal should be quantified based on not only its GI but also the amount of carbohydrate consumed. Therefore, an integrative measure of glycemic load (GL) was introduced and expressed as the product of a food's GI and the amount of carbohydrate in that food (GI × carbohydrate). Thus, each unit of GL represents the glycemic equivalence of 1g of standard carbohydrate (e.g., pure glucose), and dietary GL can be used to quantify and compare the health effects of any carbohydrate-containing foods or diets.

Although other factors, including fat and protein, influence the glycemic response, many controlled feeding studies have demonstrated that dietary GL is the key determinant for the glycemic response. GI and GL are among the many characteristics used in nutrition research and dietary advice to designate carbohydrate quality and quantity. Over two decades, numerous studies examined these two measures concerning health outcomes and chronic diseases, such as type 2 diabetes and coronary heart disease. Yet, experts remain in the debate over the relevance of the GI and GL of foods as major strategies to prevent and treat chronic diseases. Therefore, many health care providers remain cautious in making recommendations to make food choices based on these indices.

Recently, two independent meta-analyses provide additional assessments of the roles of GI and GL in affecting health outcomes. Whereas Shahdadian et al. (2019) observed inverse but non-significant associations of GI and GL with total mortality, Zafar et al. (2019) showed the significant beneficial effects of dietary GI on well-known cardio-metabolic risk factors (i.e., reducing HbA1c, fasting blood glucose, body weight, and LDL cholesterol). The authors of these systematic reviews listed limitations in their meta-analyses and concluded that more research would be needed. Nevertheless, regardless of the requirement for further research on the relation of GI and GL to health outcomes, available evidence strongly suggests considering them as essential components of carbohydrate quality. Food processing and selection of food varieties that result in higher GI should be avoided until further evidence shows otherwise.

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FROM OUR LABORAOTRY

INFECTIOUS DIARRHEA: WHAT TO REMEMBER AND RETHINK

By: Adhella Menur

Diarrhea is a common health complaint that defined as the passage of three or more unformed stools per day, often in addition to other enteric symptoms, or the passage of more than 200 g or 200 mL of unformed stool per 24 hours. Diarrhea can be classified as acute (<14 days), persistent (14 to 29 days), or chronic (≥30 days).[1] In term of severities, mild to moderate diarrhea can reduce productivity because absenteeism from school or work and may require medical treatment. Severe diarrhea can lead to hospitalization; serious sequelae such as Guillain Barre' syndrome and haemolytic uremic syndrome; and even death because of severe dehydration, electrolyte imbalance, or sepsis. Recurrent diarrhea in children is also associated with the risk of long-term sequelae, such as malnutrition, altered gut function, impaired mucosal immunity, and impaired cognitive development.[2]

Infectious diarrhea is still an important public health problem that impacts millions of people worldwide each year, especially children. Infectious diarrhea is associated with high morbidity and is the fifth leading cause of death worldwide. Based on 2018 Indonesia National Health Research (RISKESDAS), the prevalence of diarrhea is 6,8% with children under 5 years old as the highest affected population. In 2018, 8 provinces in Indonesia underwent diarrhea outbreak with the total number of sufferers were 756 people and death in 36 people (Case Fatality Rate 4,76%).[3] Various pathogens including viruses, bacteria, and parasites can be the aetiology of infectious diarrhea. Unsafe water, inadequate sanitation, and poor hygiene are the risk factors of infectious diarrhea. Given the fact that Indonesia is the second highest number of people in the world that practice open defaecation and many households still rely for their drinking water on surface water sources, such as springs, rivers, ponds and lakes, which are prone to microbial contamination, it should make diarrhea a major health concern in Indonesia.[4]

Infectious diarrhea can be classified in to non-inflammatory and inflammatory diarrhea. Non-inflammatory diarrhea is caused by pathogens that affect the small intestine and adhere to the mucosa, disrupting the absorptive and/or secretory processes of the enterocyte without causing considerable acute inflammation or mucosal destruction. Microbial causes of non-inflammatory diarrhea include rotavirus, norovirus, enterotoxigenic Escherichia coli (ETEC), Vibrio cholerae, Staphylococcus aureus, Clostridium perfringens, Giardia lamblia, and Cryptosporidium parvum. Many of these organisms secrete enterotoxins that stimulate intestinal secretion and hence the production of watery diarrhea without any blood or pus. Inflammatory diarrhea is caused by two groups of organisms i.e. cytotoxin-

Exposure or Condition	Pathogens
Foodborne	
Foodborne outbreaks	Norovirus, nontyphoidal *Salmonella*, *Clostridium perfringens*, *Bacillus cereus*, *Staphylococcus aureus*, *Campylobacter* spp, ETEC, Shiga-toxin producing *Escherichia coli* (STEC), *Listeria*, *Shigella*, *Cyclospora cayetanensis, Cryptosporidium* spp
Consumption of unpasteurized milk or dairy products	*Salmonella*, *Campylobacter*, *Yersinia enterocolitica*, *Staphylococcus aureus* toxin, *Cryptosporidium*, and STEC, *Brucella* (goat milk cheese), *Mycobacterium bovis*, *Coxiella burnetiid*
Consumption of raw or undercooked meat or poultry	STEC (beef), *Clostridium perfringens* (beef, poultry), *Salmonella* (poultry), *Campylobacter* (poultry), *Yersinia* (pork, chitterlings), *Staphylococcus aureus* (poultry), and *Trichinella* spp (pork, wild game meat)
Consumption of fruits or unpasteurized fruit juices, vegetables, leafy greens, and sprouts	STEC, nontyphoidal *Salmonella*, *Cyclospora*, *Cryptosporidium*, norovirus, hepatitis A, and *Listeria monocytogenes*
Consumption of undercooked eggs	*Salmonella*, *Shigella* (egg salad)
Consumption of raw shellfish	*Vibrio* species, norovirus, hepatitis A, *Plesiomonas*
Exposure or contact	
Swimming in or drinking untreated fresh water	*Campylobacter*, *Cryptosporidium*, *Giardia*, *Shigella*, *Salmonella*, STEC, *Plesiomonas shigelloides*
Swimming in recreational water facility with treated water	*Cryptosporidium* and other potentially waterborne pathogens when disinfectant concentrations are inadequately maintained
Healthcare, long-term care, prison exposure, or employment	Norovirus, *Clostridium difficile*, *Shigella*, *Cryptosporidium*, *Giardia*, STEC, rotavirus
Child care center attendance or employment	Rotavirus, *Cryptosporidium*, *Giardia*, *Shigella*, STEC
Recent antimicrobial therapy	*Clostridium difficile*, multidrug-resistant *Salmonella*
Travel to resource-challenged countries	*Escherichia coli* (enteroaggregative, enterotoxigenic, enteroinvasive), *Shigella*, Typhi and nontyphoidal *Salmonella*, *Campylobacter*, *Vibrio cholerae*, *Entamoeba histolytica*, *Giardia*, *Blastocystis*, *Cyclospora*, *Cystoisospora*, *Cryptosporidium*
Exposure to pets with diarrhea	*Campylobacter*, *Yersinia*
Exposure to pig faeces in certain parts of the world	*Balantidium coli*
Contact with young poultry or reptiles	Nontyphoidal *Salmonella*
Visiting a farm or petting animals	STEC, *Cryptosporidium*, *Campylobacter*
Special condition	
Age group	Rotavirus (6–18 months of age), nontyphoidal *Salmonella* (infants from birth to 3 months of age and adults >50 years with a history of atherosclerosis), *Shigella* (1–7 years of age), *Campylobacter* (young adults)
Underlying immunocompromising condition	Nontyphoidal *Salmonella*, *Cryptosporidium*, *Campylobacter*, *Shigella*, *Yersinia*
Hemochromatosis or hemoglobinopathy	*Yersinia enterocolitica*, *Salmonella*
AIDS, immunosuppressive therapies	*Cryptosporidium*, *Cyclospora*, *Cystoisospora*, microsporidia, *Mycobacterium avium* –intercellulare complex, cytomegalovirus
Anal-genital, oral-anal, or digital-anal contact	*Shigella*, *Salmonella*, *Campylobacter*, *E. histolytica*, *Giardia lamblia*, *Cryptosporidium* as well as sexually transmitted infections

producing, non-invasive bacteria (enteroaggregative Escherichia coli (EAEC), enterohemorrhagic Escherichia coli (EHEC), and Clostridium difficile) and by invasive organisms (Salmonella spp., Shigella spp., Campylobacter spp., and Entamoeba histolytica). The cytotoxin-producing organisms adhere to the mucosa, activate cytokines and stimulate the intestinal mucosa to release inflammatory mediators. Invasive organisms, which can also produce cytotoxins, invade the intestinal mucosa to induce an acute inflammatory reaction, involving the activation of cytokines and inflammatory mediators.[5]

Table 1. (above) Exposure or condition associated with pathogens causing diarrhea6

Diagnostic testing in infectious diarrhea is a thoughtful topic in terms of whether the testing should be performed or not, and the best testing to choose. Clinicians need to consider two questions when deciding to perform a diagnostic testing: Will identification of the pathogen influence patient management, such as treatment or infection-control measures? And is identification of the causative agent important from a public health perspective?[7] Researchers on the other side, should take the challenges to develop an effective and efficient diagnostic testing and give useful diagnostic testing recommendation to the clinician.

Commonly, bacterial/viral culture, microscopy to search for egg, bacteria, and parasites, and antigen-detection assays (enzyme immunoassay (EIA)-based detection) are the methods of choice for the identification of pathogens. Microscopy is widely used because it is inexpensive, but it is insensitive and requires substantial time, equipment, and training. Antigen-detection assays have represented a substantial advance for diarrheal diagnostics; however, the test characteristics are variable, and commercial assays are not available for all relevant pathogens.[8] Although the diagnostic yield of stool cultures is relatively low (1,5% - 5,6%), the guideline from Infectious Disease Society of America (IDSA) still recommend that stool cultures are important in certain settings because the identification of a pathogen can reduce unnecessary tests and allow for appropriate treatment. It is also essential to help public health officials to identify outbreaks.[6,9] Serological diagnostics are used typically for pathogens that are difficult to isolate directly. Due to the need to test both acute and convalescent sera, the practicality of serological diagnostics for infectious diarrhea is limited. Additionally, the accuracy of any serological test is dependent on the specificity of capture antigen, the titre of antibodies for that antigen in serum, and the detection modality used.[8]

Molecular testing such as polymerase chain reaction is getting much attention. The greater sensitivity of molecular testing and the ability to detect multiple pathogens in multiplex system may have clinical utility but it may not differentiate between pathogen-specific illness, contamination, normal flora, or asymptomatic infection. The more sensitive test will potentially lead to over treatment. Hence, to balance benefits and harms of testing, clinicians should consider patients' history, risk factors for severity of illness, and risk of complications.[9] Recently, several studies have examined the value of quantitative molecular testing to improve the specificity. Kang et al. demonstrated a significant correlation between rotavirus PCR Cq (cycle quantification) and disease severity in children with acute gastroenteritis. Similarly, norovirus stool viral load may help distinguish between incidental low-level carriage and higher burden norovirus-associated disease. Study about quantitative comparison between cases and controls is needed to show a significant association of high-level detection with infection.[8] Inflammatory biomarkers can be useful addition to diagnostic tests, for examples faecal lactoferrin and calprotectin that correlate with the severity and extent of colonic inflammation.[1]

Treatment for infectious diarrhea can be divided into supportive treatment and pathogen-directed treatment. The main goal of the treatment is to prevent dehydration with the use of oral rehydration solution (ORS), continuing oral feeding, and zinc supplementation.[1] There are many considerations in the decision to use antibiotics. In most people with acute watery diarrhea and without recent international travel, empiric antimicrobial therapy is not recommended. Even in immunocompetent children and adults, empiric antimicrobial therapy for bloody diarrhea while waiting for results of investigations is not recommended, except for the infants <3 months of age with suspicion of a bacterial aetiology, ill immunocompetent people with fever documented in a medical setting, abdominal pain, bloody diarrhea, and bacillary dysentery presumptively due to Shigella, and people who have recently travelled internationally with body temperatures ≥38.5°C, and/or signs of sepsis. Empiric antibacterial treatment should also be considered in immunocompromised people with severe illness and bloody diarrhea. Antimicrobial therapy should be narrowed when antimicrobial susceptibility testing results become available. Probiotics may be used to reduce the symptom severity and duration of infectious diarrhea in immunocompetent children and adults.[6,9]

Human gut wall is the house of 70%-80% immune cells, the healthy gut that free from infectious diarrhea will support better immune and improve brain performance.[10] Remember and rethought the importance of infectious diarrhea should lead us to the better understanding of local burden of the infection by specific pathogen and better design of prevention program.

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INA-RESPOND Newsletter

BENEFITS OF EXERCISE FOR PEOPLE WITH AUTISM

By: Marco Ariono

Autism Spectrum Disorder (ASD) refers to a complex category of neurobiological development disorders, which is typically diagnosed during childhood.[1] People with ASD are at a higher risk of having obesity and cardiovascular disease compared to the general population.2 Research has also revealed that individuals with ASD have lower physical fitness scores (cardiovascular endurance, upper body and abdominal muscular strength and endurance, and lower body flexibility) when compared to their typically developing (TD) peers.[3]

Physical activity in People with ASD

ASD is an array of complex developmental/neurological disorders affecting the functioning of the brain. It has diagnostic characteristics such as impaired social interaction, delayed or limited communication skills, and stereotypic patterns of behavior.[4] Also, individuals with ASD may have delayed motor development, display low levels of engagement in the daily living activities going on around them, and exhibit a lack of motivation to engage in physical activity.[5] Children with disabilities are less likely to engage in sustained and vigorous exercise and the physical activity levels were significantly lower compared with their peers who were developing typically. They lacked involvement in team and non-team sports and engaged in more solitary physical activities such as bicycling and swimming. Limited physical activity levels in individuals with ASD may be attributed to their impairments in motor, social communication, sensory, and behavioral domains. Despite these barriers, research has shown that physical activity reduces negative behaviors and promotes positive behaviors among individuals with ASD.[6] Bouts of physical activity have been shown to improve behaviors such as stereotype, aggression, and self-stimulatory behavior.[7]

Adolescents with ASD may have unique difficulty finding opportunities to engage in physical activity as many of them have deficits in social interactions, which can include difficulty with understanding social cues, games requiring social interaction, making friends, sharing, and turn-taking.[8] Also, opportunities to engage in physical activity may lessen as children with ASD age and the play environment becomes increasingly competitive and activities demand more advanced skill.[9]

Prevalence of Obesity in People With ASD

Obesity is caused by a positive energy balance in the body due to increased energy intake or decreased energy expenditure, or both.[10] Children with ASD are at least as likely to be overweight or obese as their peers who are developing typically. The prevalence of obesity in children with ASD is 30.4% compared with 23.6% in age-matched children without ASD.[11] Among children with chronic disabilities, the prevalence of obesity is more significant in children with ASD than in children with other developmental disabilities, including ADHD and learning disability.[12] The multisystem physical,

psychosocial, and systemic impairments in this population may contribute to their higher obesity prevalence. Obesity is associated with long-term physical and psychosocial consequences, including diabetes, stroke, osteoarthritis, increased cardiovascular risk, stigma, and depression.[13]

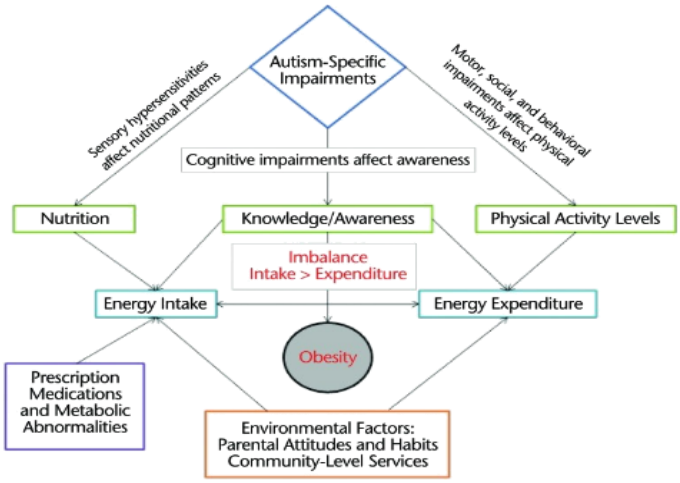

Figure 1. Contributing factors for obesity in children and adolescents with autism spectrum disorders (ASD)

ASD Friendly Strategies for Encouraging Physical Activity

The Centers for Disease Control and Prevention (CDC) recommends that children get at least an hour of physical activity daily. Shorter periods of physical activity tend to be easier to maintain than the longer one. The goal is to make physical activity a regular and enjoyable part of daily life. We can start to encourage physical activities by walking to school, walking the dog, or playing with another family member. Then, we gradually expand the time we spent on these activities.[14]

We also must try to build some fundamental motor skills. We can try running, jumping, hopping or skipping, making the exercise fun. After that we can do some activities with equipment such as a ball and racket; we can play catch and throw. Hopefully, the children enjoy these activities. Show them the enjoyment and value you gain from being active. Teachers, especially physical education teachers, can be a great influence.[14]

Consider contacting the people who run recreational sports programs in the community. Some may worry that they lack the skills to engage and include someone with autism in their programs. we may be able to give them the confidence they need by sharing our strategies for communicating, motivating, and instructing them.[14]

Here are three practical strategies commonly used in activity programs designed for youth who have autism:[14]

Ideally, we want people with autism to have access to a physical activity program led by facilitators who understand how to communicate and motivate them in autism-friendly ways.

We should build a regular physical activity program.

Most people with autism are visual learners. Visual supports such as task cards, physical demonstrations, and video modeling often prove very helpful.

A meta-analysis by Healy et al. showed that youth who participated in physical activity programs designed for individuals with autism showed significant gains in their social and communication skills. When designed appropriately, physical activity programs can provide a fun, safe setting for interacting with other children. In other words, they can offer excellent opportunities for practicing social skills. Also, activities involving animals such as horseback riding provide children with a fun way to interact nonverbally as well as verbally.[14]

Healy et al. also found that physical activity programs also improved their muscular strength and endurance by participating in programs such as exergaming, aquatic exercise and horseback riding. Strength and endurance are essential for not only physical health but also for taking advantage of social opportunities that involve physical activity including recreational sports and non-structured games. They also found that many types of physical activities improve skill-related fitness for youth with autism. These activities included computer-based exergaming, jumping on a trampoline (with supervision and safety barriers), motor skill training (e.g., table tennis) and horseback riding.[14]

A lot of kinds of physical activities require what we call "fundamental motor skills." These basic skills include running, throwing, catching and so on. Healy et al. also found that exercise programs significantly improved these skills among youth with autism.[14]

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