SOUVENIR

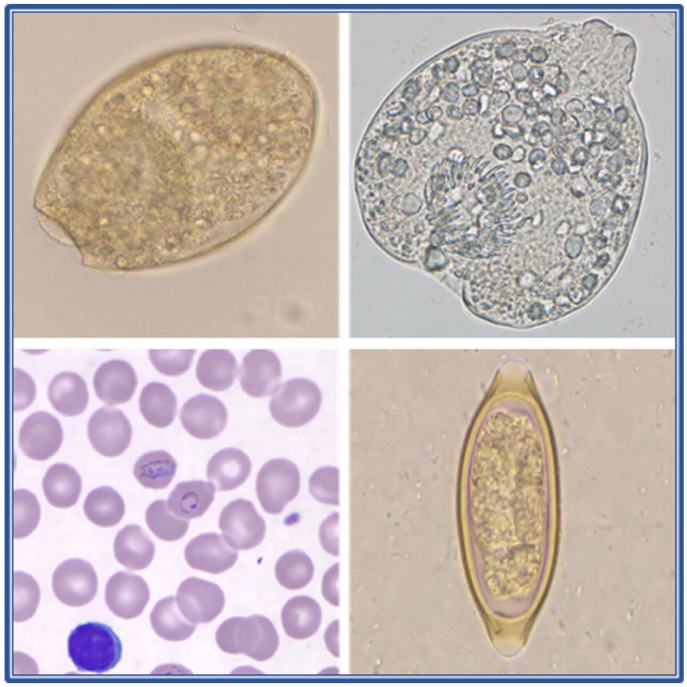
TROPACON 2021

DECEMBER 10-11, 2021

XV Annual Conference of the Indian Acadamy of Tropical Parasitology (IATP)

on

"One Health Approach for the Control of Parasitic Infections"



Department of Medical Parasitology
Postgraduate Institute of Medical Education and Research
Chandigarh, 160012, INDIA

CONTENTS

ORGANIZING COMMITTEE

XV Annual Conference of Indian Academy of Tropical Parasitology (IATP),

December 10-11, 2021

ORGANIZING COMMITTEE:

Chairperson:	Prof. Rakesh Sehgal
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MESSAGE OF THE PRESIDENT, IATP

I am very happy that the XV TROPACON 2021 is being organized by the Department of Medical Parasitology, PGIMER, Chandigarh from December 10-11, 2021.

For the past more than a one and half years we have been in the midst of a pandemic of COVID-19 and this has curtailed a lot of activities. Though, at the moment we are gaining in the fight against the virus due to control measures and one of the best vaccination campaigns in the world, still travel is restricted at places and may be risky. Therefore, after deliberations with the Committee members it was decided that this year also the conference will be held by the virtual mode. The team of the Department of Medical Parasitology agreed to hold the conference at a short notice and IATP is obliged to them for the same.

The IATP continues to expand with more members and has increased its activities with various regional and state chapters organizing CME/conferences, etc. This is done with the aim to disseminate knowledge of parasitic infections, most of which are neglected. A furtherance of the goal to control and eliminate parasitic infections from India is another goal of the IATP and the Academy supports all efforts of the Government.

The team of Department of Medical Parasitology has put in their best efforts and the conference will be a great scientific achievement. I wish them success for this!

I would like to request all the members and the students to actively participate in the conference.

Wishing the conference, a great success!

(Prof. S.C. Parija)

"संस्थान में हिंदी पत्रों का स्वागत है"
परजीवी विज्ञान विभाग
स्नातकोत्तर चिकित्सा शिक्षा एवं अनुसंधान संस्थान, चण्डीगढ़ - 160012 (भारत)
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MESSAGE

It gives us immense pleasure to hold the 15th National Conference of Indian Academy of Tropical Parasitology (IATP), at PGIMER, Chandigarh from 10-11thDecember 2021. We are thankful to the IATP to bestow upon us this privilege!

Though there was decline in the COVID-19 cases, but it was decided that this year also we would hold the conference in the virtual mode. The past several months was filled with lot of stress due to COVID-19 pandemic, still going on and I am sure that all of our microbiologists have contributed in this hour of need. Our efforts are slowly but surely winning this war.

The Organizing Committee of the IATP and especially the Department of Medical Parasitology, PGI has made special efforts to make this conference an international event, and to include many eminent and prestigious international and national faculty in the up-to-date scientific program. We hope that the sessions will leave an imprint on the minds of delegates.

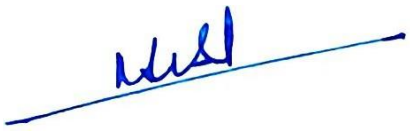
The theme of the Conference is ‒One Health Approach for the Control of Parasitic Infections‖. This concept is based on the fact that the health of humans, animals and ecosystems are interlinked. It is an integrated approach that include physicians, veterinarians and other scientific, health and environmentally related disciplines to study parasitic infections and evolve strategies for their control. With a successful win over a novel disease such as COVID-19 in a very short period of time, it is the time for various groups of experts to control other infectious diseases.

A lot has been done for the control of parasitic diseases in the past and we have succeeded in the elimination of Dracunculosis from the country by using simple preventive measures for its control. The aim now is to eliminate the big three – malaria, leishmaniasis and filariasis. A wide implementation and success of mass drug administration campaigns for helminthic infections is another excellent success story as far as the control of parasitic infections is

concerned. For the continued success of all the control programs in the country, our Academy is poised to play a pivotal role.

I am sure that under the aegis of the IATP team this conference will be a useful source of knowledge for the participants, as this is the only conference in India which exclusively deals with human parasitic infections.

Warm wishes and sincere regards,



Organizing Chairman

XV TROPACON 2021

"संस्थान में हिंदी पत्रों का स्वागत है"

परजीवी आयुर्विज्ञान विभाग

स्नातकोत्तर चिकित्सा शिक्षा एवं अनुसंधान संस्थान, चण्डीगढ़ - 160012 (भारत)

DEPARTMENT OF MEDICAL PARASITOLOGY

POSTGRADUATE INSTITUTE OF MEDICAL EDUCATION & RESEARCH CHANDIGARH - 160 012 (INDIA)

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MESSAGE

The **human–animal–ecosystem** interface plays an important role in the evolution and emergence of pathogens. It is estimated that among all the known infectious diseases prevalent worldwide, approximately 60% are zoonotic infections. Furthermore, zoonoses contribute to about 75% of the **emerging infectious diseases**. Considering the major role of zoonoses and the environment in human health, it is clear that successful public health interventions require the cooperation of human, animal and environmental health communities. The theme of TROPACON 2021 is –One Health Approach for the Control of Parasitic Infections. Thus, keeping this in mind, we have tried to include specialists in the field of human and veterinary microbiology, parasitology, both from India and abroad, in formulating the scientific programme for TROPACON 2021. The topics include recent updates on human parasitic infections , epidemiology, diagnosis, pathogenesis, treatment and control. In addition, zoonotic parasitic infections with few such interesting cases have been included.

On behalf of organising committee of the 15th Annual Conference of Indian Academy of Tropical (IATP), I welcome the distinguished guests, colleagues, national and international faculty, delegates attending this academic event on December 10-11, 2021. I hope that the conference will enrich all the attendees with new information and better understanding of parasitic diseases and their control.

Organizing Secretary

XV TROPACON 2021

SCIENTIFIC PROGRAM :: DAY 1 :: DEC 10, 2021

SESSION/ CHAIRPERSONS	TIME	TOPIC	SPEAKER/ CHAIRPERSONS/ JUDGES
	08.30 am – 9.30 am	***Inaugural function***	**Inauguration by: Dr Surjit Singh, Hon'ble Director, PGIMER, Chandigarh**
SESSION I **Chairperson:** Dr J Mahanta	9.30 am – 10.00 am	**PRESIDENTIAL ORATION** Climate Adaptation Impacting Parasitic Infections	**Dr SC Parija** President, IATP Vice-Chancellor, Shri Balaji Vidyapeeth, Puducherry
SESSION II **Chairperson:** Dr SC Parija	10.00 am – 10.40 am	**DR SC PARIJA ORATION AWARD** Parasites and humans: A journey of three decades	**Dr Rakesh Sehgal** Head, Department of Medical parasitology, PGIMER, Chandigarh
	10.40 am – 11.00 am	***Tea break***	
SESSION – III **Chairpersons:** Dr J Mahanta Dr Rakesh Sehgal	11.00 am – 11.30 am	Recent updates on diagnosis of cestode infections	**Dr S. Geetalakshami** Vice-President IATP; Vice Chancellor, The Tamil Nadu Dr. M.G.R. Deemed University
	11.30 am – 12.00 noon	Recent advances in diagnosis of protozoan parasites	**Dr Ujjala Ghoshal** Head, Department of Microbiology, SGPGI, Lucknow
	12.00 noon – 12.30 pm	Therapeutic application of Manuka honey for the treatment and prevention of contagious diseases and its potential applicability in mitigating parasitic infections	**Dr Sudip Ray** Principal Scientist, New Zealand Institute Minerals to Materials, Auckland, New Zealand
SESSION – IV **Chairpersons:** Dr S. Geetalakshami Dr Anil Phukan	12.30 pm – 1.00 pm	Recent updates on the diagnosis of soil transmitted helminths	**Dr Bruno Leveke** Professor, Department of Virology, Parasitology and Immunology, Ghent University, Belgium
	1.00 pm – 1.30 pm	Current scenario of parasitic infections in India	**Dr Sumeeta Khurana** Professor, Department of Medical Parasitology, PGIMER, Chandigarh
	1.30 pm – 2.00 pm	***Lunch break***	
SESSION – V	2.00 pm – 3.30 pm	**ORAL PAPER PRESENTATION S – I**	**Chairperson:** Dr Tuhina Banerjee, Dr RumpaSaha
	3.30 pm – 3.50 pm	***Tea break***	
SESSION – VI	3.50 pm – 5.00 pm	**E-POSTER PRESENTATIONS**	**Chairpersons:** Dr Ujjala Ghoshal, Dr Jaswinder Kaur Oberoi

SCIENTIFIC PROGRAM :: DAY 2 :: DEC 11, 2021

SESSION/ CHAIRPERSONS	TIME	TOPIC	SPEAKER/ CHAIRPERSONS/ JUDGES
SESSION I **Chairpersons:** Dr ML Dubey Dr KN Prasad	9.00 am – 9.30 am	Newer antiparasitic agents in horizon	**Dr Abhijit Chaudhury** Professor, Department of Microbiology, Sri Venkateswara Institute of Medical Sciences, Tirupati
	9.30 am – 10.00 am	Advances in pathogenesis of amoebiasis	**Dr Tuhina Banerjee** Professor, Department of Microbiology, Banaras Hindu University, Varanasi
	10.00 am – 10.30 am	***Tea break***	
SESSION II **Chairpersons:** Dr Baijayantimala Mishra Dr Sumeeta Khurana	10.30 am – 11.00 am	Cases in Zoonotic Parasitic Diseases – the Old, the New and the Unexpected	**Dr Richard Bradbury** Senior Lecturer in Microbiology and Molecular Biology, Federation University, Australia
	11.00 am – 11.30 am	Zoonotic malaria	**Dr Abhishek Mewara** Associate Professor, Department of Medical Parasitology, PGIMER, Chandigarh
SESSION III **Chairpersons:** Dr Nancy Malla Dr Pratima Gupta	11.30 am – 12.00 noon	Molecular epidemiology of cystic echinococcosis	**Dr Shiv Shekar Chatterjee** Head, Department of Microbiology, Diamond Harbour Medical College, Diamond Harbour
	12.00 noon – 12.30 pm	Cutaneous leishmaniasis in India	**Dr Vibhor Tak** Associate Professor, Department of Microbiology, AIIMS, New Delhi
SESSION IV **Chairpersons:** Dr BR Mirdha Dr Abhishek Mewara	12.30 pm – 1.00 pm	The journey of IATP EQAS in parasitology	**Dr Rakesh Singh** Professor, Department of Microbiology, JIPMER, Puducherry
	1.00 pm – 1.30 pm	Disease burden and molecular epidemiology of cryptosporidiosis	**Dr Nonika Rajkumari** Associate Professor, Department of Microbiology, JIPMER, Puducherry
	1.30 pm – 2.00 pm	***Lunch break***	
SESSION – V	2.00 pm – 3.30 pm	**ORAL PAPER PRESENTATIONS – II**	**Chairpersons/Judges:** Dr Karthika Jayakumar, Dr Priya Datta
	3.30 pm – 3.50 pm	***Tea break***	
SESSION – VI	3.50 pm – 5.00 pm	**ORAL PAPER PRESENTATIONS – III**	**Chairpersons/Judges:** Dr Vinay Khanna, Dr Upninder Kaur
	5.00 pm – 5.30 pm	***Valedictory function & concluding remarks***	

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Guest Lectures

CLIMATE ADAPTATION IMPACTING PARASITIC INFECTION

Prof. Subhash Chandra Parija
President, IATP Vice-Chancellor,
Shri Balaji Vidyapeeth, Puducherry

Adverse environmental changes resulting from the rapid and progressive climate disturbances have triggered parasites to evolve and adapt. With many climate-adaptive changes including genomic adaptation, parasites are expanding the geographical boundaries and influencing the traditional approaches of parasite-host relationship to persist. It has resulted in a parasite becoming highly transmissible, and infectious in terms of **parasite drug resistance, pathogenicity, and tissue tropism. It has also increased global incidences of** emerging and/or re-emergence of infectious parasites especially those occupying new boundaries. With the current trend suggesting more public health threats from those climate-adaptive infectious parasites, there is a need to invest and adopt strategies for threat management. Genomics investigations in terms of biosurveillance to contain the spread and disease spill overs, understanding the mechanism of genomic adaptation to find the drug targets, and developing adequate capacity in terms of manpower and infrastructure may be faciliatory towards effective medical countermeasures. In this presentation, accumulated evidence on the climate adaptation by the infectious parasites will be discussed to consolidate some strategies for better health preparedness and public safety.

RECENT UPDATES ON DIAGNOSIS OF CESTODE INFECTIONS

Dr. S. Geethalakshmi
MBBS, MD, Phd Vice-President IATP;
Vice Chancellor, The Tamil Nadu Dr. M.G.R. Deemed University

Cestode infectionsare now considered as a neglected group of potentially life-threatening infectious diseases that pose an important public health challenge globally, particularly in Asian countries. The WHO has recently listed Echinococcosis as both a Neglected Zoonotic Disease and a Neglected Tropical Disease to prioritize attention for control strategies. Cysticercosis/taeniasis has also been placed on the list of the six major helminth diseases of humans for the control and elimination.

In the past 50 years, enormous progress has been made in the diagnosis, treatment and control of Cestode infections. The diagnosis of Cestode infectionsand also the detection of their sources for human infection arevery important from epidemiological aspect as well. The identification of hosts and parasites at the species level would contribute to a better understanding of the present distribution of different taxa.Morphology-based diagnoses are cheap and relatively easy but in most cases do not enable identification at the species level. Imaging studies are not only useful in differential diagnosis and evaluation but they are important in identifying the number, the location, and the stage of the infection.Immunologic testing is useful for both primary screening and confirmation testing for parasitic diseases. Cestode infection diagnosis often requires both imaging and serological testing. Polymerase chain reaction of stool tests is also available for the detection of Cestode infections.Nevertheless, PCR and sequencing, although highly precise, are too complicated, long, and expensive to be employed in medical laboratories for routine diagnostics.

With all the recent advances, further research is yet needed, to optimize broader, cheap, and rapid molecular diagnostic tests to facilitate rapid diagnosis and for epidemiological studies.Improved, simple, cost-effective, point of care diagnostic tools for diagnosis of Cestode infections are still the need of the hour especially to be used in symptomatic patients in remote areas who need to be referred for imaging and further management.

RECENT ADVANCES IN DIAGNOSIS OF INTESTINAL PROTOZOAN PARASITES

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In developing country, like India intestinal protozoan parasitic infections are still remaining as the most important disease of public health concern and are the leading cause of morbidity and mortality especially among the children. It is postulated that the prevalence is high probably due to poor sanitary conditions and improper personal hygiene practice. Intestinal protozoan parasites include the Amoebae (*Entamoeba histolytica),*the Flagellates (*Giardia and Dientamoeba*), The Ciliate (*Balantidium coli*), The Protists (*Blastocystis),*the Sporozoa(*Cryptosporidium spp., Cyclospora cayetanensis, Cystoisospora belli and Sarcocystissp) and Microsporidia spp.* Laboratory diagnosis of these infections still relies on labor-intensive and insensitive methods involving staining of stool sample and microscopy. Newer and more sensitive methods include a variety of antigen detection ELISAs and rapid tests; Molecular detection techniques are highly sensitive and specific and isothermal amplification are being developed. There is still a need for highly sensitive and specific tests that are rapid and cost-effective for use in developing countries where the disease is highly prevalent. In recent years, new molecules of diagnostic value are being discovered and new tests being developed. The recent advances include the discoveries of new biomarkers that may help distinguish between different infection stages of these parasitic infections. In this lecture we will try to cover the recent advances in the field of diagnosis of intestinal protozoan parasitic infections with increased emphasis on *Entamoeba histolytica, Giardia spp., and opportunistic pathogens like Cryptosporidium spp and Microsporidium* etc.

THERAPEUTIC USE OF MANUKA HONEY FOR THE TREATMENT & PREVENTION OF CONTAGIOUS DISEASES AND ITS POTENTIAL APPLICABILITY IN MITIGATING PARASITIC INFECTIONS.

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The rise of antimicrobial resistance and the continued prevalence of multidrug-resistant microorganisms has become one of the largest threats to face modern medicine. Infection by parasites also causes a broad spectrum of clinical manifestations including subclinical (inapparent), localized (skin lesions), and disseminated infections (cutaneous, mucosal, or visceral). Hence there is a dire need for alternative treatments, which should also be affordable, easily accessible, and has the least side effects. Amongst the alternative treatments, natural products such as honey have been used to treat a plethora of ailments since ancient times, from gout to pain relief. One of the most common and persistent therapeutic use of honey has been as a wound dressing due to its antimicrobial properties. However, the actual medicinal benefits of honey may vary depending on geographical location, floral origin and honeybee physiology. Based on the pharmacological and clinical studies, one particular honey that showed significant therapeutic benefits and attracted the most attention in medical and pharmaceutical research is Manuka honey. Derived from the nectar of the manuka tree, *Leptospermum scoparium*, a native of New Zealand, Manuka honey has been identified for the increased antimicrobial activity against a range of microorganisms mainly attributed to its exclusive content of methylglyoxal. Also, a recent pioneering study showed its effectiveness in mitigating parasitic infections against anaerobic protozoans such as Giardia and Trichomonas under in vitro conditions. This presentation will highlight the botanical source of this honey and elucidate the interrelationship between its holistic chemical composition and exceptional ability for the treatment and prevention of contagious diseases. Potential chemical markers and the gradation of Manuka honey for medicinal uses will be described. Evidence of its efficacy against various microbes and parasites from animal studies and clinical trials will be provided. Future perspectives of this research area for enhancing the pharmacokinetics and more effective uses in the management of infectious diseases will be recommended.

RECENT UPDATES ON THE DIAGNOSIS OF SOIL-TRANSMITTED HELMINTHS

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Traditionally, soil-transmitted helminths (STHs) have been diagnosed by detecting worm specific eggs in stool using a compound light microscope. Since the 1990s, Kato-Katz has been the World Health Organization recommended diagnostic standard for quantifying eggs in stools, and hence it has been used to guide soil-transmitted helminthiasis control programs. During the last decade, a variety of new diagnostic tests have been introduced to the STH field, including both other microscopy-based, and DNA-based methods. Each of these tests have important advantages and disadvantages over the Kato-Katz. Most diagnostic technologies based on biomarkers other than eggs or DNA (e.g. antigens, antibodies and metabolites) or other sample matrices (e.g. serum and urine) are either not yet explored or in research phase. Recently, the World Health Organization (WHO) established the Diagnostic Technical Advisory Group to identify and prioritize diagnostic needs for neglected tropical diseases, and to ultimately describe the minimal and ideal characteristics for new diagnostic tests (the so-called target product profiles (TPPs)). During this presentation we will provide an overview of the currently available diagnostic tests and assess how they meet the WHO TPP for STH.

CURRENT STATUS OF PARASITIC INFECTIONS IN INDIA

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Human beings are known to harbour>300 species of worms & 70 species of protozoa. A large burden of parasitic diseases is borne by tropical and sub-tropical regions. Parasitic infections are strongly associated with poverty and lead to loss of productivity, aggravation of poverty, impaired life quality and hindered socioeconomic development. These have a significant effect on physical, socioeconomic, mental and cognitive ability and are significant threat for travellers to endemic regions. Among the infections reported to be neglected by WHO, more than 50% are parasites. Among the parasites, malaria is responsible for significant morbidity and mortality across the globe. India contributes to 2% of the global malaria case burden and 32% of global malaria deaths (52% of all malaria deaths outside Africa) and is mainly attributed to *Plasmodium falciparum*. India carries 47% of the global *P. vivax* malaria burden, and it frequently remains established long after cure of initial infection due to presence of hypnozoites persisting in the liver. Despite being the highest malaria burden country of the SEA region, India achieved a reduction of 83.34% in malaria morbidity and 92% in malaria mortality between the year 2000 (20,31,790 cases, 932 deaths) and 2019 (3,38,494 cases, 77 deaths), thereby achieving Goal 6 of the Millennium Development Goals (50-75% decrease in case incidence between 2000 and 2019). Similar progress in control of parasitic infections has been made due to implementation of national disease control programmes for soil transmitted helminthiasis, visceral leishmaniasis, filariasis etc. However, complacence, laxity in control and poor resource allocation leads to re-emergence of these diseases. Moreover, there is always a likelihood of failure of control programmes due to drug resistance, insecticide resistance etc. Surveillance for these infections as well as zoonotic parasitic infections like *Plasmodium knowlesi, Ancylostoma caninum,; drug resistance to malaria, kala etc.* must be in place for ultimate control and elimination of these diseases.

ANTI-PARASITIC AGENTS: PRESENT AND THE FUTURE.

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The discovery and introduction of parasitic agents has been almost at a standstill for the last few decades and has lagged much behind, compared to anti-viral or anti-bacterial drugs.

Challenges in anti-parasitic drug development: There are innumerable obstacles and challenges in the development of these agents both methodological as well as economic. Most of the existing agents were developed either for some unrelated conditions or for veterinary use. This trend is still continuing to a large extent, although new technologies like genomics, proteomics, and bioinformatics are beginning to be used for drug discovery. The lack of suitable animal models, particularly for helminthes and the use of alternate species of the parasite as decoy for the pathogen has considerably hampered drug discovery. The reluctance of pharmaceutical companies to invest in the R & D is another major limiting factor. The lack of any significant commercial return from the neglected diseases has resulted in a general withdrawal of the pharmaceutical industry from involvement in anti-parasitic drug development.

New drugs in market: During 2010-21, only 5 anti-parasitic agents have got FDA clearance, although a few of them had been in use for some years previously, particularly in certain endemic geographic regions. These 5 drugs are: Miltefosine as oral treatment for all forms of leishmaniasis (2014), Tefenoquine as a single dose to prevent relapse in vivax malaria (2018), Moxidectin for *Onchocerca volvulus*(2018), Triclabendazole for *Fasciola hepatica* (2019), and Fexnidazole as the first all oral treatment of Human African trypanosomiasis caused by *Trypanosoma brucei gambiense* (2021).

Drugs in Development: Maximum work is being done to develop novel anti-protozoan agents, with malaria heading the list. A total of 14 new antimalarial drugs are in clinical development, nine of which are in Phase II; while five are in the pipeline as anti-leishmania agents; and three in phase II trial as anti-trypanosomal drugs. An interesting drug in Phase II is the anti-leprosy drug clofazimine repurposed for cryptosporidiosis therapy. In contrast to protozoa, development of new agents to treat helminthic infections is in a sad state with no drug entering into the clinical trial stage at present, and most of them not even in the pre-clinical stage. Currently, the discovery of anthelminthes is revolving around four strategies: Target based screening of compound libraries, Modification/combination of existing agents, Repurposing of drugs, and Exploration of plant products used in traditional medicine.

ADVANCES IN PATHOGENESIS OF AMOEBIAS

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Entamoeba histolytica, the causative agent ofamoebiasis has been recognized as one of the causes of moderate-to-severe diarrhea in South Asia and sub-Saharan Africa by the population-based surveys of the pediatric diarrheal diseases. The pathogenesis of amoebiasis incorporates multiple crucial steps including degradation and invasion of the mucosal layer by *E. histolytica,* adherence of trophozoites to intestinal epithelium, invasion into the host tissues and finally dissemination to other organs. The beginning of the infection due to *Entamoeba* is marked by the ingestion of mature quadrinucleate cysts. For the establishment of the pathogenesis, *E. histolytica* binds to the mucus layer through galactose/N-acetyl-D-galactosamine (Gal/GalNAc) lectinto gain access to the epithelial cells. Recently, lysine-glutamic acid rich protein 1 (KERP1) and cysteine protease adhesin (CPADH112) has also been known to contribute in the adherence of *E. histolytica*to the mucosal layer. Calcium ions (Ca^{+2}) play crucial role in the binding of the ligands by Gal/GalNAc lectin. In recent advancement, it is known thatCa^{+2} participate in a number of mechanisms of pathogenesis like cytolysis of target cell, phagocytosis, trogocytosis etc. *E. histolytica* also possesses a number of glycosides that can remove the branched polysaccharides from the mucin or the host cells. These include α-d-glucosidase, β-d-galactosidase, α-*N*-acetyl-d-galactosaminidase, β-*N*-acetyl-d-glucosaminidase and β-l-fucosidase. Among these, β-*N*-acetyl-d-glucosaminidase has central role in degradation of the carbohydrates of mucin. This scarcity of the free carbohydrate creates a competition with the commensal microflora which can be the potential reason for turning on the switch for the pathogenic nature of *E. histolytica.* Additionally, β-amylase and *E. histolytica* cysteine protease (EhCP), EhCP5 has been known to play critical role causing a breach in the mucus layer for the invasive trophozoites. EhCPs cause robust destruction of the protein backbone in mucin layer. *E. histolytica* induces the intestinal epithelial cellsfor recruitment of neutrophils and to release monocytes and other chemokines. However, *E. histolytica* responds by producing the secreted products that inhibit chemotaxis and mobility of these immune cells.

E. histolytica causes killing of host cells via contact dependent mechanism using Gal/GalNAc lectins. After the degradation of the epithelial cells, *E. histolytica* navigate through the extra cellular matrix for dissemination to the extra intestinal sites. EhCPs lead to the activation of the host matrix metallo proteinases (MMPs) which are believed to play a role in the massive extracellular matrix degradation. Associated microflora has also been known to contribute in the establishment of pathogenesis of this parasite. Recently, it was found that *Prevotella* enhances the virulence of *E. histolytica* in the diarrheal cases. Thus, the establishment of the pathogenesis of *E. histolytica* is an interplay of different factors related to parasite, host and environment.

CASES IN ZOONOTIC PARASITIC DISEASE- THE OLD, THE NEW AND THE UNEXPECTED.

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The field of diagnostic parasitology has moved forward at a tremendous pace over the past two decades. Conventional PCR, followed by real-time PCR has advanced the field, but these are not without limitations when applied to parasite diagnostics. Despite these significant technological advances, it is still sometimes necessary to find a good parasitologist with a microscope and the knowledge of obscure parasitic infections who can identify difficult, novel and emerging parasitic infection cases. The loss of morphological parasitology skills and the extensive use of multiplex PCR for parasitic disease diagnosis in diagnostic laboratories may lead to these less common parasitic infections being –missed‖ in the diagnostic process.

This talk will briefly summarise several real diagnostic parasitology cases in an interactive format. Each case represents a –rare‖ parasitic infection of humans, many of which are emerging zoonoses. The diagnostic features, epidemiology, and significance of each parasite presented will be discussed. It is vitally important that advanced skills in parasite zoology, morphology and diagnosis be respected, valued, and retained to ensure that new and emerging parasitic diseases are identified, correctly treated and appropriately controlled.

ZOONOTIC MALARIA

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Last two decades have witnessed a paradigm shift in our understanding of the malaria caused by species other than the traditionally known human *Plasmodium* species—*P. falciparum*, *P. vivax*, *P. malariae* and *P. ovale*. The emergence of the malaria parasite of long-tailed macaque monkeys, *P. knowlesi*, as the fifth malaria species of humans has made the scientific community consider the risk of other zoonotic malarias, such as *P. cynomolgi*, *P. simium*, *P. inui* and others, to humans. The development of knowledge about *P. knowlesi* as a pathogen which was earlier only known to experimentally cause malaria in humans and rarely cause natural infection, towards its acknowledgement as a significant cause of human malaria and a threat of malaria control programmes has been made possible by the use of advanced molecular techniques such as polymerase chain reaction and gene sequencing. It is important to understand that the human malaria parasites *P. falciparum* and *P. vivax* also have their origins in the non-human primates such as gorillas and chimpanzees before they made a cross-species switch and established themselves as human pathogens. The study of their evolution from apes to humans may help us to understand the zoonotic potential of other ape malaria parasites. Further, it is important to study the impact of the zoonotic malarias on the malaria control programmes, and the unique strategies needed to overcome the challenges posed by these parasites to public health.

MOLECULAR EPIDEMIOLOGY OF CYSTIC ECHINOCOCCOSIS

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The advent of molecular genetics has paved the way towards precise and accurate delineation of the epidemiology and pathologic spectrum of Cystic Echinococcosis [CE] (caused by *Echinococcus granulosus*sensulato). At this juncture of time, scientific efforts from the world over have delineated 10 Genotypic variants (G1 to G10), and six species from the previous single species *Echinococcus granulosus*. This apart there more species causing Alveolar Echinococcosis (AE, *Echinococcus multilocularis*), and neotropical polycystic cysticercosis (*Echinococcus vogeli*&*Echinococcus oligartha)* have been recognized as human pathogens since last 70 years. The genetic diversity has been delineated using multiple techniques including mitochondrial DNA analysis (*cox1*&*nad1* genes) & sequencing, partial nuclear DNA analysis of regions like ITS1, Antigen B/1, BG1 DNA probe, Actin III, MS microsatellite U1 sn RNA, elongation factor1a, Eg9 & Eg16. Random Amplification of Polymorphic DNA (RAPD) has also been tried to study the genetic variability among CE isolates. However, the mitochondrial genetic analysis has yielded the best results for delineating the genotypes. Genetic Variants G1, G2 & G3 constitute what is now known as *Echinococcus granulosus*sensusricto. This species is characterized commonly by a Sheep-Dog/Wolf life cycle; however, other intermediate& definite hosts are also common. Overall, G1 is numerically the most common of hydatid disease in humans; in most areas worldwide, it is the predominant genotype, except a few regions where G6 stakes the claim in total absence of G1. *Echinococcus equinus* corresponds to G4, physiologically distinct in its strobilation & developmental properties as well as near complete absence of infection in humans. *E. equinus* has an Equine Animal (horse, zebra, Donkey) – carnivore (dog/wild felid) life cycle. Due to infection of horses with multiple other Genotype s of *Echinococcus granulosus*, molecular confirmation seems necessary, G5 (the cattle strain) also known as *Echinococcus ortlepi*has a cattle-Dog/Jackal life cycle and can also cause human disease, albeit as acephalocysts. *Echinococcus canadensis* (G6 to G10) is the predominant human infection in Sudan, Egypt, Poland & Australia where *Echinococcus granulosus*s.s. is near absent. This species consists of the camel strains (G6), Pig strains (G7, G9), and the cervid strains (G8, G10) may be further divided into three species later. All these five G types (G6 to G10) have been shown to cause human disease, but some severe infections have also been documented among cervid strains causing medical concern. *Echinococcus felidis* (_lion strain‘) is documented in Lion/Hyena-Warthog Life cycles and has not been reported to cause human disease. Similarly, *Echinococcus shiquicus* is restricted to a life cycle of Tibetan Fox-Tibetan Pica and not reported to cause human infections so far. Geographical documentation for *E. equinus* is mostly from Sub-Saharan Africa & Central Europe; *E. ortlepi* from Europe, Asia & Africa; that for *E. shiquicus* is Tibet while *E. felidis* has been reported solely from Africa. *Echinococcus granulosus*sensusricto has been documented world over, E. *canadensis* from Eurasia, Africa, North & South America. Future molecular epidemiology studies may help us facilitate diverse patterns of diagnostic tests, targeted management strategies, vaccination and control measures against CE.

CUTANEOUS LEISHMANIASIS IN INDIA

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Cutaneous Leishmaniasis is a neglected tropical vector borne parasitic disease prevalent in over 88 countries of the world. Globally it is the most common form of leishmaniasis infection caused by 20 different Leishmania species. It has an estimated prevalence of 12 million cases and an annual incidence of 1-1.5 million cases.

In India there is an emergence of cutaneous leishmaniasis in several new foci in hitherto non-endemic regions of the country like Himachal Pradesh, Jammu & Kashmir, Kerala, Karnataka, Assam etc. far beyond the traditional endemic zones in the Thar desert and north western parts of the country. In India cutaneous leishmaniasis mainly occurs due to *Leishmania tropica* in the endemic region of Bikaner but in newer non endemic foci *Leishmania major* and *Leishmania donovani* have been reported as the causative agents. The common vector found in India is *Phlebotomuspapatasi*, &*Phlebotomussergentipes*. In new foci local sandfly species like *Phlebotomuslongiductus* have been implicated as vectors in Himachal Pradesh. The Indian gebrils and dogs have been reported as reservoir hosts in Bikaner and as the disease emerges in newer foci more locally available reservoir hosts may be identified in the near future. Cutaneous leishmaniasis is a great imitator and can present a diagnostic dilemma to the clinicians due to atypical and unusual presentations. Therefore, demonstration of the presence of parasite is quintessential for effective management of the cases. The laboratory diagnosis of cutaneous leishmaniasis is mostly based upon microscopic demonstration of amastigote forms on skin smears or histopathology. Culture on specialized media and animal inoculation for diagnostic purpose are both time consuming and require expertise and therefore are rarely carried out nowadays. Recently an immunochromatographic card has been introduced for detection of Leishmanial antigen in ulcerated skin lesions with high sensitivity. Molecular techniques like PCR-RFLP, sequencing using ITS1, k DNA targets have been used in specialized laboratories for diagnosis as well as speciation of causative agent of cutaneous leishmaniasis.

Therefore, cutaneous leishmaniasis is an emerging public health challenge in India as the disease is being diagnosed in newer foci with susceptible population implicating the successful local adaptation of the agent and vector in these newer ecological niches. Therefore, high degree of clinical suspicion, early laboratory diagnosis and adequate treatment along with upscaling of public health measures for effective vector control are of utmost importance to limit the potential scars which may be inflicted by cutaneous leishmaniasis.

THE JOURNEY OF IATP EQAS IN PARASITOLOGY

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Participation in the External Quality Assessment Scheme (EQAS) is an important key component of quality control in any laboratory services. It was neglected in the Parasitology part, and therefore Indian Academy of Tropical Parasitology (IATP) felt the need for the Parasitology EQAS in 2011. It is a challenging task to organize a national-level EQAS program. An EQAS coordinator was nominated and this assignment was given to him. A coordination committee was also constituted. EQAS material is provided by the members of the coordination committee and distributed to the participating centres by the EQAS coordinator. Any parasitic diagnostic laboratory can enrol in this program by sending details in IATP EQAS proforma and paying a nominal registration fee. Only **nine laboratories** enrolled in the first IATP EQAS activity. Initially stained slides were distributed and centres were supposed to report. Later on unstained smear were distributed and centres were asked to stain it and report. Thereafter a serology component was introduced. IATP EQAS activity regularly organizing two microscopic and one serology rounds in a year. Feedback is given to the participating centres after analysing all the reports within a given time frame. Distributing IATP EQAS material in the northeast region was a challenge. EQAS material for molecular testing is planned but not initiated because of fewer stakeholders. Benefits of participating in IATP EQAS activity includes introduction of quality control in laboratory services, awarded IATP EQAS certificate, getting good quality rare slides and clinical samples which can be used for academic purpose, and EQAS program provides guidance to improve the diagnostic services in parasitology. IATP EQAS activities were conducted even during COVID-19 pandemic. It is run by the JIPMER, Puducherry since inception and it was decided in this year to expand it by including PGI Chandigarh and SGPGI, Lucknow. IATP EQAS program is appreciated in all parts of India. As a result, a total of **48 laboratories** are currently participating in IATP EQAS program.

DISEASE BURDEN AND MOLECULAR EPIDEMIOLOGY OF CRYPTOSPORIDIOSIS

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Cryptosporidium, an emerging pathogen, disproportionately affects children in developing countries and immunocompromised individuals. It commonly causes self-limiting 2–3 week diarrhea. In the immunocompromised or malnourished, the infection may develop into a prolonged life-threatening disease. Disease incidence is also increasing in industrialized countries largely as a result of outbreaks in recreational water facilities. Recent advances in knowledge are shifting opinions of the epidemiology of cryptosporidiosis, and have increased estimates of the global burden of disease. Results of recent studies with PCR and antigen detection suggest that previous studies underestimated the frequency of infection, identifying cryptosporidium in 15–25% of children with diarrhoea. Results of cohort studies have consistently shown that younger age was associated with high risk of infection. In a multicentre study of children younger than 5 years in India, 75% of cases were in children younger than 2 years. Studies suggested that cryptosporidium infection is associated with malnutrition and growth deficits in children.

Although human infections have been noted with more than 15 species, most infections worldwide have been attributed to *Cryptosporidium hominis* and *Cryptosporidium parvum*. Malnutrition in early childhood also increases the risk of diarrhoea with cryptosporidium as seen in a study from Bangladesh. Advances in molecular methods like subtyping, genotyping, multilocus typing, next generation sequencing analysis etc, have yielded new insights into the epidemiology of cryptosporidiosis. Molecular diagnostic tools have played an important role in improving our understanding of the transmission of *Cryptosporidium*spp including *Giardia lamblia*. It has led to the identification of major differences in infection sources of *Cryptosporidium* spp. in humans between developing countries and industrialized nations, differences in clinical presentations and virulence among *Cryptosporidium* species and *C. hominis* subtypes, and roles of genetic recombination in the emergence of virulent and hyper-transmissible *C. hominis* and *C. parvum* subtypes. These tools are now widely used in outbreak investigations and surveillance of cryptosporidiosis in industrialized nations.

Oral & Poster Presentations

OP: SURVEILLANCE OF *ANOPHELES* VECTORS AND THEIR ROLE IN MALARIA TRANSMISSION IN THE STATE OF PUNJAB, INDIA

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Punjab is one of the states which is reporting ≤1 API in all the 22 districts for the last five years and thus qualifies for malaria elimination under Category 1. Mosquito vector control is one of the most effective methods for reducing malaria transmission. In the entomological surveillance conducted from 2017-2019, 11 anopheline species were recorded from 9 districts of Punjab, out of which three primary vector species, viz., *An. culicifacies, An. stephensi*and *An. fluviatilis*, and secondary vector *An. annularis* were found. The malaria vectors were further tested for their susceptibility status to the insecticides DDT, malathion and deltamethrin following the standard WHO procedures, and all the vector species showed some level of resistance to the insecticides tested in all the districts surveyed. The vector species were subjected to molecular analysis to know their sibling species status, host meal preference, and those found positive for human blood were also screened for *Plasmodium* species infections by PCR. All the vectors were found to have sibling species complexes. The human blood index (HBI) was found to be highest in *An. stephensi* (0.46) followed by *An. culicifacies* (0.24). None of the blood was positive for malarial parasites, hence the role of the vector species in the disease transmission remained unclear. The possible reasons for precipitation of insecticide resistance may be due to selection pressure of extensive insecticides used in the agricultural sector in the state of Punjab. Overall, the indigenous malaria transmission in Punjab is very low and seasonal with predominance of *P. vivax* malaria. The imported/migratory cases also contribute largely for the low level of transmission triggered by prevalence of multi-vector species and their behavioural attributes. Continuous surveillance of malaria vectors and their carriage of *Plasmodium* species is crucial for the success of elimination programmes.

OP: SEROPREVALENCE OF TOXOPLASMA GONDII IN HIV INFECTED CASES AND ITS ASSOCIATION WITH CD4 COUNT IN SILCHAR MEDICAL COLLEGE AND HOSPITAL

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Background-Toxoplasma encephalitis, affecting 15-40% of world's PLHIV, is the world's most common opportunistic parasitic co-morbidity conventionally when CD_4 count falls below 200/µl. But there has been reports of both symptomatic and asymptomatic Toxoplasma IgG seropositivity in PLHIV with CD_4 count in the range of 200-500/µl. Despite the presence of research papers on seroprevalence of toxoplasmosis in PLHIV in northern, western and southern India, there is paucity of data on its seroprevalence and associated risk factors from Assam and its neighbouring North-eastern states especially when the adult HIV prevalence and incidence in this part is higher than the national prevalence. So, this prospective cross-sectional study was carried out from June 2018-May2019 to determine the seroprevalence of Toxoplasma gondii in the PLHIV and its association with CD_4 count, demography, ART and various risk factors in PLHIV attending the only tertiary care referral center in southern Assam catering also to cases from Mizoram, Nagaland and Manipur.
Method- Qualitative anti-Toxoplasma IgG ELISA was performed on stored serum samples of 200 HIV seropositive cases with proper consent, having recent CD_4 count below 500/µl baring the antenatal HIV cases and those below 12yrs age. CD_4 counting was done by Flow-Cytometry.
Result-94 out of 200 PLHIV cases were found to be Toxoplasma IgG seropositive making its seroprevalence 47%.CD_4 count was significantly less than 200/µl in 54% cases and in the range of 200-500/µl in remaining 46% cases. Toxoplasma seropositivity was significantly associated with history of 1stTrimester abortion and in those on ART but had no significant association with age, gender, handling of felines, blood transfusion, occupation.
Conclusion-Thus, the finding of this study iterates in favour of initiating prophylaxis against Toxoplasma routinely even in HIV cases with CD_4 count in 200-500/µl range in patients of this region as quite good proportion of symptomatic Toxoplasma seropositive HIV cases have CD_4 count in this range apart from the conventionally vulnerable group with CD_4 count below 200/µl.

OP: PLANT-BASED THERAPEUTICS AGAINST *PLASMODIUM FALCIPARUM* INFECTION: MOLECULAR DOCKING, DYNAMIC SIMULATION AND ADMET ANALYSIS

Shyamapada Mandal

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Objectives: To explore the inhibition of *Plasmodiumfalciparum* L-lactate dehydrogenase (pf-LDH) by two phytochemicals: ajmalicine, a monoterpenoid indole alkaloid from *Rauwolfiaserpentina* and *Catharanthus roseus*, and **ajmaline,** an alkaloid from *Rauwolfiaserpentina*, and their similar compounds, such as vincamine and vinburnine (for ajmalicine), and prajmaline and lorajmine (for ajmaline) following bioinformatic approaches (molecular docking, dynamic simulation and pharmacological prediction), for plant-based management of malaria.

Materials and methods: The 3D structures of the ligands (ajmalicine, vincamine, vinburnine, ajmaline, prajmaline and lorajmine) were retrieved from PubChem, and were docked, using AutoDockVina inbuilt in UCSF Chimera, to pf-LDH protein target, the crystallographic structure of which was accessed from RCSB protein data bank, and affinity of the ligands were recorded in terms of binding energy. Molecular dynamic simulation was performed to authenticate the stable protein-ligand complex formation. Pharmacological properties of the ligands were predicted using SwissADME and pkCSM webservers. The control drugs used were artesunate and piperaquine.

Results: The respective binding energy for ajmalicine and its similar compounds vincamine and vinburnine were -8.3, -7.2 and -7.8 kcal/mol, while the values for ajmaline and its similar compounds prajmaline and lorajmine were -7.6, -7.0 and -7.4 kcal/mol. The BE for the two antimalarials, artesunate and piperaquine were -7.9 and -9.2 kcal/mol. All the ligands obeyed the Lipinski's rule of 5 without any violation, except piperaquine with one violation (molecular weight >500 g/mol). The ligands displayed blood brain barrier permeability (except artesunate) with high gastro-intestinal absorption property, and good bioavailability score, 0.85 being the highest value for ajmalicine.

Conclusion: Current findings suggest the usefulness of the bioactive phytochemicals in order to prepare alternate biotherapeutics for the treatment of malaria, and provide an appropriate preparative initiation of plant-based drug development through *in vitro* and *in vivo* studies.

OP:DETECTION OF HIDDEN PARASITES IN COMMERCIAL VS ORGANIC VEGETABLES

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Background: Vegetables are an essential part of a healthy human diet for their nutritional value. Some vegetables are eaten raw as a salad to retain the natural taste and preserve heat-labile nutrients. Studies have shown eating raw vegetables contaminated with helminths can result in various parasitic infestations. The use of night soils, cow dung as a fertilizers in organic farming and wastewater for irrigation could cause parasitic contamination of vegetables. This study aims to detect parasites from raw vegetables grown by both organic and commercial farming. To our knowledge this is the first study to look for parasites in vegetables grown by organic farming.

Methodology: Institutional ethics committee (CSP/21/AUG/97/408) approval was obtained before the start of this cross sectional study. Commercial(Pesticidal) and organic raw vegetables potato, carrot, army tuber, ginger, coriander,cabbage& cauliflower were bought from local markets and organic farming centers. The same lot of raw unwashed vegetables , vegetables washed with reverse osmosis (RO) water and vegetables washed with hot water (60^{o}C) were soaked in saline.vegetables samples were examined by wet mount and iodine mount after processing by traditional sedimentation technique.

Results: Motile Strongyloides larva was predominantly detected in both commercial and organic farming vegetables. In addition, we detected ova and larva of hookworm, ova of Ascaris, cysts of Entamoeba histolytica, Entamoeba coli, and Giardia. Highest parasites (70%)were detected in un-washed vegetables followed by vegetables washed with RO water(40%). Parasites were not detected in the same lot of vegetables washed with hot water (60^{o}C).

Conclusion: There is no difference in detection of parasites in both commercial and organic farming vegetables. The authors advocate the use of hot water washing of raw vegetables before consumption especially for salads,since it does not alter the taste as well as removes the parasites.

OP: COMPUTATIONAL APPROACH FOR IDENTIFICATION OF DRUG TARGETS: CHOKE POINT ANALYSIS

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BACKGROUND-Leishmaniasis is a complex disease, with visceral and cutaneous manifestations. Drug resistance and treatment failure are the responsible factors that are causing hindrance in the eradication of *Leishmania.* Considering these factors, discovery of new and potent drugs for the treatment of Leishmaniasis is the need of the hour. In this study, focus is on identification of choke point compounds which could be the possible future drug targets by subjecting the Leishmania genome to BLAST with the e-value inclusion threshold set to 0.005 and choke point analysis

METHODS-*Leishmania major*, strain Friedlin gene sequence is available from GeneBank. BioCyc and KEGG pathway database was used for pathway information. The pathways which are essential for the survival of the parasites were extracted from the above databases. KEGG database annotation was used to identify the pathways present only in the parasite but not in the humans. Corresponding protein sequenceswere extracted from the KEGG database and were subjected to BLASTp search against the non-redundant database with the e-value inclusion threshold set to 0.005. The search was restricted to proteins from *H. sapiens*.

RESULTS-A total of 180 choke point compounds have been identified after analysing the different metabolic pathways present in the parasites. The enzymes associated with the synthesis of these compounds have also been identified. The corresponding genes and protein sequences have also been fetched out and are subjected to further analysis to find out the hub genes.

CONCLUSION-This is a newer approach for the initial steps in identification of compatible drug targets. These methods are highly useful for the identification of compatible drug targets in a very precise manner.

OP: EVALUATING THE DISEASE SEVERITY IN *PLASMODIUM VIVAX* CLINICAL INFECTIONS.

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Background: *Plasmodium vivax* is the most geographically widespread species and is recently associated with severe malaria and leading to death in few cases. There are several molecular markers which have been used for the prediction of severe malaria in *P.falciparum* and many of these play a role in disease pathogenesis. Few genes and biomarkers like *vir, msp3α* genes, Super oxide dismutase (SOD-1), Tumor necrotic factor (TNF- *α*), Interleukin(IL-10) are speculated to play important role in disease severity in natural infections.

Methods: *P.vivax* samples were collected and diagnosed with microscopy and RMAT.*Pvmsp3α, vir* profiling and cytokine analysis was done by PCR assay, PCR-RFLP, RT-PCR and ELISA for genetic diversity studies and to assess a potential biomarker of disease severity in Indian population.

Results: Severe and non-severe samples of *P.vivax* were collected as per WHO classification**,** out of which 39 were severe and 45 were non-severe. By microscopy parasitemia was calculated and it was seen that parasitemia does not seem to have any correlation with disease severity (*p-value*=0.38). Genotyping of *Pvmsp3α* and *vir* gene analysis in clinical samples revealed four major genotypes of which *Pvmsp3α* i.e. type B (1.5kb) was most predominant.*Vir* genes profiling showed high level of expression for all *vir* genes in severe isolates when compared to non-severe isolates. Cytokine analysis revealed that the levels of SOD-1, TNF-α and IL-10 were to be significantly more in the severe group when compared to non-severe group.

Conclusion: The use of these molecular and biochemical markers can provide an understanding in assessing the severity of infection in *P.vivax* clinical samples.

OP: EFFICACY OF NOVEL CHALCONE DERIVATIVES ON EXPERIMENTAL CEREBRAL MALARIA

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Background: Cerebral malaria is a fatal multifactorial disease, having high morbidity and mortality (approximately 20%) in absence of effective treatment. Increasing drug resistance against *P. falciparum* contributes further more morbidity. The objective of this study was to evaluate the *in vivo* antimalarial efficacy of chalcone derivatives on experimental cerebral malaria model.

Methods: Chalcone derivatives proven to be potent under in vitro malaria culture testing were studied for in vivo antimalarial activity on *P. bergheiAnka infected experimental* models. For this 72 C57BL6/N mice of either sex were divided into six groups (control, Quinine 20 mg/kg for five days, Chalcone derivatives A41 and AV21 10 mg/kg for five days and AV27 20mg/kg for five days), infected by intraperitoneal inoculation with *Plasmodium berghei* ANKA parasites and were observed and sacrificed for evaluating several parameters, like behaviour changes, parasitemia, histopathological observations, augmentation of ICAM-1 and cytokine expression.

Results:*In vivo* malaria models showed highly significant result at the tenth day of treatment with all the three chalcones A41, AV21 and AV27 as compared to non-treated group ($p<0.001$) in terms of parasitemia. Histopathological sections of spleen, liver and brain reflects accumulation of more malaria pigment in non-treated group as compared to treated. Also there were increased expressions of ICAM-1 level in non-treated mice as compared to treated.

Conclusion: The present study clearly indicate the potential inhibitory action of Chalcones against the malarial parasite *P. berghei*ANKA that suggests these derivatives can be used as an adjunct therapy for severe malaria.

Keywords: Chalcones, Cerebral Malaria, Histopathology

OP: GENETIC DIVERSITY OF DBL1A DOMAIN OF *VAR* GENE IN SEVERE AND NON SEVERE INDIAN FIELD ISOLATES OF *PLASMODIUM FALCIPARUM*

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Background-*Plasmodium falciparum* has the ability to avoid the splenic clearance through the cytoadhesion of variant surface antigen (VSAs) which is expressed on the surface of infected erythrocyte membrane to binds with many host endothelial cell receptors. The major VSA protein is *P. falciparum* erythrocyte membrane protein-1(PfEMP-1) encoded by *var* genes. Based on large genomic studies on 3D7 reference strain, *var* gene family have been divided into three major groups (A, B, and C) and two intermediate groups (B/A and B/C) according to 5‘ and 3‘ un-translated regions (UTR) and location on chromosome. Two exons are present with *var* gene, extracellular domain, variable part of protein and transmembrane region of protein is encoded by exon I and intracellular and relatively conserved acidic terminal segment (ATS) domains are encoded by exon II. A variable number of conserved motifs are present in each *var* gene. Two to seven Duffy-binding like (DBL) and cystein-rich interdomain region (CIDR) are encoded by each *var* gene. DBL domain in *var* gene have been classified into six types; α, β, γ, δ, ε, and x. Some studies have been shown that DBL and CIDR domain involved in sequestration and rosetting of infected erythrocytes. The present study was undertaken to know the genetic diversity of DBL1α domain of *var* gene in severe and non severe Indian field isolate of *P. falciaprum*.
Methods- Severe and non-severe patient were recruited in this study from Delhi region in India. Full length mRNA was isolated from positive malaria samples and reverse transcribed into cDNA. PCR, cloning and sequencing was done to analyze the sequence diversity of DBL1α domain of *var* gene.

Results and conclusions-Genetic diversity of DBL1α of *var* gene relation with disease severity was studied in Indian field isolate. Five severe and Five non-severe samples were successfully sequenced and analyzed according to cysteine/PoLV1-4 grouping and classified into six different groups of DBL1α domain of *var* gene. By this classification it has been confirmed that diversity of DBL1α of *var* gene is highly diverse and showed unique and rare sequences of DBL1α domain of *var* gene in severe and non-severe patient sample which can have different role in disease severity.

OP: SCREENING FOR *STRONGYLOIDES STERCORALIS* IN IMMUNOCOMPROMISED INDIVIDUALS BY ENZYME-LINKED IMMUNOSORBENT ASSAY

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Background: Strongyloidiasis caused by the nematode parasite *Strongyloidesstercoralis* has been included in the World Health Organization's road map for neglected tropical diseases 2021–2030 as one of the neglected soil-transmitted helminthiases. Strongyloidiasis may lead to hyperinfection or disseminated infection in immunosuppressed individuals. Though this helminthic worm is known to be present in tropical and subtropical countries, only a few case series and case reports indicate the prevalence of the infection in India; there is a paucity of surveillance studies, especially in immunocompromised persons.

Methods: We screened 76 patients with immunosuppressive conditions and/or on steroids/cytotoxic medications from various OPDs (Oncology, Paediatrics, Pulmonology and Rheumatology) and medical wards of PGIMER, Chandigarh, for the presence of IgG antibodies against *Strongyloides*using IgG ELISA.

Results: Out of 76 patients, eight (10.5%) were found positive for IgG antibodies. Of these, there were five pediatric and three adult patients with age ranging from 2 to 25 years; three were males and two were females. There were five patients from pediatric OPD, two from oncology, and one from gastroenterology ward. Of the eight seropositive patients, four belonged to Himachal Pradesh, three to Punjab and one to Haryana.

Conclusion: In this pilot screening of immunocompromised patients for IgG antibodies for strongyloidiasis, we found 10.5% patients to be seropositive from varied clinical specialties and geographical locations. Our results suggest that *Stronglyoides* infection may be widely prevalent in India, and extensive screening studies are required to be carried out in patients from different geographical areas to estimate its true prevalence in India.

OP: NICOTINAMIDE- VITAMIN B3 AS ANTI-PLASMODIAL AGENT AGAINST CHLOROQUINE RESISTANT MALARIA IN AN *IN VIVO* MODEL

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Nicotinamide- an amide derivative of nicotinic acid has been used at high doses for the forty years for various therapeutic applications. Some previous *in vitro* studies have reported its antimicrobial effects along with anti-malarial activity but its antiplasmodial effect has never been studied in drug resistant *in vivo* model. In the present study, we have analyzed different doses (in the therapeutic range) of Vitamin B_3 (Nicotinamide) for their antiplasmodial activity against Chloroquine resistant (CQR) resistant malaria in experimental murine model of chloroquine resistant malaria. The best dose inhibiting the plasmodium growth was further combined with fixed dose of Chloroquine (CQ) to determine if it improves the efficacy of CQ in CQR malaria model. Nicotinamide was the most effective at higher dose of 4.55 mg/kg with 88% growth inhibition and 95.27% when combined with chloroquine in CQR infected group. This was further confirmed by *Plasmodium* specific 18s rRNA by RT-PCR in liver where the 18s rRNA significantly decreased with all the doses of NICO and also with combination of high dose of NICO (4.55 mg/kg) and CQ (65 mg/kg). The difference in the liver pathology score was significantly lower with the high dose of NICO (4.55 mg/kg) and as well its combination with CQ (65 mg/kg) as compare to CQR untreated. The pathology score in brain decreased significantly with the combination therapy unlike other organs. Intracellular ROS levels in liver lymphocytes and serum NO levels were significantly reduced with the combination therapy. So our study demonstrates that nicotinamide has antimalarial potential alone and shows synergistic effect when combined with chloroquine.

OP: TAENIA SOLIUM CYST STAGE PROTEASES INHIBITORS AS NEW DRUG TARGETS FOR TREATMENT OF NEUROCYSTICERCOSIS.

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Abstract: Background: The larval stage of Taenia solium causes central nervous system infections, neurocysticercosis (NCC) which leads to the onset of acquired epileptic seizures in endemic regions. NCC alone causes about 70% epileptic cases in endemic areas. The mass anthelminthic drive against soil transmitted helminths by world health organization (WHO) to control the spread of these parasites had lead to the generation of resistance against pre-existing drugs. Hence, there is an urgent need for new drugs. Proteases are primary enzymes which are involved in parasite‘s invasion to host and its immune system which make them one of the primary targets for the development of new drugs.

Material & methods: We employed proteomics approaches to identify the proteases expressed by the cysticerci stage of T. solium isolated from naturally infected swine. Then to identify the new drugs we did docking studies with FDA approved drugs ZINC 15 drug bank to repurpose them.

Results: We confirmed the presence of proteases in cyst wall and cyst fluid of parasite through gelatin zymography, and identified them by LC-MS/MS. We found 23 proteases in cyst wall and 50 in cyst fluid of T. solium. Seven of them were essential and by docking studies we sorted five FDA approved drugs along with two protease inhibitors with anti-helminthic properties. Finally, we found 70-90% cysticidal capacity to Phenyl vinyl sulfone (PVS), 1,10- phenanthroline and Belinostat in in-vitro experiments, but PVS performed poorly on cytotoxicity assay. The 1,10-phenanthroline was even less cytotoxic compared to well-known anthelminthic drugs albendazole and praziquantel.

Conclusions: We identified the proteases present in cyst stage of *T. solium* and established them as suitable drug candidates to treat NCC with least side effects and high specificity.

E-P: TWO PRONGED COMMUNITY INITIATIVES BY A GOVERNMENT OF BACKWARD STATE THAT DECREASED PREVALENCE OF SOIL TRANSMITTED HELMINTHS IN CENTRAL INDIA: A BREAKTHROUGH ACHIEVEMENT

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Background: Intestinal parasites are major public health problem in tropical and subtropical countries affecting the poorest and most deprived communities. More than 1.5 billion people, or 24% of the world‘s population, are infected with STHs, of which 225 million are in India. The Indian Government has proactively initiated measures to break the vicious cycle of anaemia – malnutrition due to parasitic infections.

Materials and methods: The study was undertaken to ascertain impact of the government initiatives viz. Open Defecation Free (ODF) drive and mass administration of single dose Albendazole on burden of intestinal parasites. Stool samples received at AIIMS, Bhopal Microbiology laboratory across all age group were studied for presence of protozoan trophozoites / cysts and helminthic ova. The percentages were calculated to find out prevalence of various parasitic infections.

Results: Out of 4620 stool samples studied, 389 (8.41%) were positive either for protozoal or helminthic infections compared to 40.7% prevalence reported in 2013 in the same region. Protozoan infections was found to be more common than helminthic infection with Giardia duodenalis infection being most common; 201 (51.67%), followed by Entamoeba histolytica;174 (44.73%). The helminthic infections put together constituted 14 (3.5%) of the positive stool samples with Hook worm ova observed in 6 (1.5%) cases.

Conclusion: This study has proven that policy level initiative viz _Swachh Bharat Abhiyan‘ and observance of _National Deworming Day‘ started in 2014-15 led to significant reduction of intestinal parasites in Central India and relatively higher reduction of STH compared to protozoan parasites can be ascribed to the activity spectrum of albendazole. It is probably the first study to make impact assessment of government measures on bringing down intestinal parasitic infections in Central India. This study also showed that more measures will be required to control intestinal protozoan parasites.

Keywords- Soil transmitted helminths, Neglected tropical disease, Central India, National Deworming Day, and Swachh Bharat Abhiya

E-P: RISK FACTOR ANALYSIS OF HUMAN CRYPTOSPORIDIOSIS

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Background- Cryptosporidiosis, a significant gastrointestinal disease of both humans and vertebrate animals across the world, caused by several species of the intestinal coccidian *Cryptosporidium*. Transmission to humans occurs primarily by feco-oral route. Associated risk factors for cryptosporidiosis include primary and acquired immunodeficiency disorders, solid organ transplantation, protein energy malnutrition (PEM) and others, do vary with –at risk‖ population and changing socio-demographic status. The present work prospectively analysed different risk factors of the disease and brings out the change over a decade in a tertiary care health setting.

Methods-A total of nine thousand one hundred seventy-four (9174) stool samples were examined for *Cryptosporidium* spp. during the year 2017-2021. Out of these, 101 patients were positive for cryptosporidiosis. Details of these patients were examined for analysis of risk factors. The results were compared with previous published work (2011-2016) from our own laboratory and change/s in risk factors over this period was/were studied.

Results- Of 101 cryptosporidiosis cases, 65.3% (66/101) were adults with male to female ratio of 1.9:1. Diarrhoea was the most common clinical presentation. HIV sero-positive patients contributed to 37.6% (38/101) followed by 19.8% and 1.9% with secondary and primary immunodeficiency disorders respectively. But the most common risk factor was found to be solid organ (renal) transplantation in 40.5% (41/101). Comparing with earlier published work, relative increase in incidence among adults and secondary immunodeficiency conditions were the changing trends which was statistically significant ($p<0.05$).

Conclusion-The present study concludes that cryptosporidiosis is increasing in adults in comparison to children and in secondary immunodeficiency conditions like malignancy, chronic kidney disease, nephrotic syndrome, steroids intake. Cryptosporidiosis being both anthroponotic and zoonotic infection, it is imperative that veterinarians, environmentalists and medical health care professionals must join hands to develop –One Health‖ approach for control and management of cryptosporidiosis.

E-P: PREVALENCE OF AMOEBIC LIVER ABSCESS IN A TERTIARY CARE CENTRE IN INDIA (2019-2021)

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Background-Fifty million people per year globally are infected by *Entamoeba histolytica*,the etiological agent of amoebiasis. Its clinical manifestations vary from asymptomatic to severe signs, including extra-intestinal abscesses and dysentery. The most frequent manifestation of invasive amebiasis is Amoebic Liver Abscess (ALA). This study aims to analyze the incidence and the demographic profiles of Amoebic Liver abscess patients in a tertiary care centre in India.

Methods-Between April 2019 and November 2021, the demographic data of 154 patients who had been analysed for the presence of *Entamoeba* in liver abscess by conventional PCR in routine setting were assessed.

Result - Among the 154 pus samples that were analysed, the overall prevalence rate came out to be 66.23% (102/154). Positivity rate was found to be higher in males (71.42%) in comparison to that of females (55.10%). Moreover, high incidence rate of 40.19% was seen in children (Below 14 years). Three covid patients were also found to be infected with *Entamoeba.*

Conclusion-The data showed that the male patients in the study had a higher prevalence of Amoebic liver Abscess than female patients in the same geographic region. The high positive rate among children could be attributed to the region's poor sanitation and widespread endemicity of amebiasis.

E-P: SCREENING FOR INTESTINAL PARASITES IN CANCER PATIENTS

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Background: Diarrhoea in cancer patients may either be due to immunosuppressive drugs or infectious agents like bacteria, viruses or parasites. Cancer patients on immunosuppressive drugs (chemotherapy) are often neglected group in research of infectious diseases. Reports on parasitic carriers /infections among cancer patients are sparse in India. This study aimed to detect the intestinal parasites in cancer patients who were under immunosuppressive therapy.

Methodology: This is a prospective cross sectional study conducted in a tertiary care centre. Institutional ethical committee approval (CSP/20/DEC/88/230) was obtained prior to the start of the study. Informed consent was obtained from participants (adults >18 years) and parents/ guardian in case of children (<18 years). Freshly voided stool samples were examined by direct wet mount and iodine mount. Formalin-ether concentration was done to improve the detection of parasites and wet mount was performed from the sediment. Modified Ziehl-Neelsen (1% H2SO4) staining was done to detect *Cryptosporidium*, *Isospora belli*, and *Cyclospora cayetanensis*. Fifty stool samples were collected from oncology patients (Out-patients, n=13 & In-patients, n=37) who were on immune suppressive therapy. The samples were collected from March 2021 to November 2021. Sample collection was severely hampered by lock down restrictions due to COVID-19 pandemic.

Results: Participant‘s median age was 28.3 years (Age range- 1-78 years). The male/female ratio of participants were 1:1.3. Twelve patients (24%) had loose stools and the rest (76%) were semi-solid in consistency. Parasites were detected in 4% (2/50) of stool samples. Cyst of *Giardia intestinalis* (n=1) and *Entamoeba histolytica* (n=1) were identified in children <18 years who did not show any gastro-intestinal symptoms.

Conclusions: Cancer patients on immunosuppressive therapy have a higher risk of developing severe parasitic infections. Continuous screening and prompt reporting of parasitic infections or carrier state to clinicians will aid in effective management.

E-P: TAENIA SOLIUM IMPAIRS HELICOBACTER PYLORI-INDUCED INFLAMMATION AND PROGRESSION OF AGS CELLS

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Background- Helicobacter pylori is a microaerophilic bacterium that colonizes in the antrum of the stomach. Its chronicity exacerbates gastric atrophy, dysplasia, metaplasia, and gastric adenocarcinoma. H. pyloriinduced inflammation and cancer progression can be influenced by diet and more amusingly coinfection of helminths. Taenia solium is a helminth parasite that commonly infects humans in tropics and causes taeniasis in the intestine. The parasite is linked to Th2 immunity, leading to a reduced inflammatory condition. The co-infected patients are common in endemic areas, but no study has been taken to understand the interplay of these two pathogens and their subsequent effect on the outcome of chronic inflammatory diseases like gastric adenocarcinoma. Therefore, we aim to explore the effect of H. pylori on gastric adenocarcinoma (AGS) cells in the presence of T. solium crude lysate (CL).

Methods -The AGS cells were treated with CL and subsequently infected with 100MOI of H. pylori. After 24 hrs incubations cells were analysed for apoptosis, proliferation, ROS production and associated cellular signalling molecules. We did RT-qPCR for mTOR, MERTK, TYK2, TYRO3, MAPK, JAK2, FGFR, YES1 and PDK1 and checked the phosphorylation status of mTOR, PI3k, and Akt kinases through western blot.

Results -We found that CL increased the apoptotic death, not necrotic of H. pylori-infected AGS cells. It also limits H. pylori-induced proliferation and ROS production in AGS cells. The CL downregulates the mRNA expression of mTOR, MERTK, TYK2, TYRO3, MAPK, JAK2, FGFR, YES1 and PDK1 etc, and decrease the phosphorylation mTOR, PI3k, and Akt kinases and migration of H. pylori-infected AGS cells.

Conclusion Thus, our study suggests a negative correlation between T. solium and H. pylori in gastric inflammation and prior infection with taenia may decrease the progression of gastric carcinoma

E-P: A rare case of vulval myiasis

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Background & Objectives: -Myiasis is a condition, where maggots (larvae) invade living tissue of various parts of the body (nose, eye, and genitalia etc) in patients of different ages. Clinically maggots attack cutaneous tissue, body cavities, and gut lumen and lays eggs from which larvae develop causing myiasis. Genital myiasis is quite infrequent and only a few are reported.

Materials & Methods: - A 22 year old primigravida, tribal women delivered a 3.5 kg male child in a rural health centre vaginally with right sided mediolateral episiotomy. Thereafter, she developed pain, foul smelling vaginal discharge and burning sensation during micturation. She noticed worms coming out of her vulval introitus, and also came out during defecation.

Results: - She was brought to our hospital. Episiotomy wound was cleaned with saline antibiotic solution and dressed daily. Ether was applied to kill any hidden larvae. Analgesics and broad –spectrum oral antibiotics were started. Wound healed by secondary intention. The larvae were collected and analyzed. It was identified as Chrysomiamegacephala, also known oriental latrine fly.

Conclusion: -Vulval myiasis is an extremely rare condition. Lack of proper hygiene, coexisting genital infections, uncontrolled diabetes mellitus and senility are few of the predisposing causes for myiasis. Illiteracy and poverty leading to use of dirty clothes in the genital area following delivery and open defecation in fields are few of the associated causes of vulval myiasis. Health education and use of sanitary napkins can be a solution to this condition.

E-P: EXPANDING TAENIA SOLIUM FATTY ACID BINDING PROTEIN FAMILY AND THEIR ASSOCIATED IMMUNOLOGICAL PROPERTIES

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Background-Neurocysticercosis (NCC) is a neurological infection caused by the larval stage of Taenia solium, it accounts for 30% of newly acquired epilepsy in endemic areas. For survival, helminths including T. solium uptakes nutrients from the host including fatty-acid molecules. The helminth parasites lack its own de novo lipid biosynthesis machinery, so it expresses small molecular weight fattyacid binding proteins (FABPs; 13-15kDa) One of the major functions of FABPs is to transport the lipid ligands, however they can be secretory in nature and are also involved in immune signaling pathways.

Methods- We used a homology-based approach to identify all FABPs in T. solium proteome using SWISSMODEL and analysed their secondary structure using Phyre2 server. Secretory and membrane interacting properties were analysed by TMHMM and Phobius2.0 tools. Molecular-modelling and molecular dynamics were done using Schrodinger maestro while docking (against IgG1 Fab region) was performed using Hawkdock server.

Results We predicted 5 FABPs in T. solium proteome and among all TsM_0001185100, TsM_000544100, TsM_000802800 and TsM_000425500 shown to have 2 α-helices and 10 β-strands which is a characteristic of FABPs; however, TsM_000713700 has 9 β-strands with 2 α-helices in its secondary structure. Molecular dynamics (MD) study revealed TsM_001185100 and TsM_000544100 were most stable compared to other members. To analyse their potential as a vaccine candidate, all proteins were computationally simulated as injections in mice which induced high IgG1-antibody titre value. MD simulation of docked complexes revealed TsM_001185100 and TsM_000544100 were forming the most stable complexes with the IgG1 Fab region. We also found all five FABPs are expressed at the RNA level in the larval stage of the T. solium infection.

Conclusion –Using computational approaches our study suggests among five FABPs present in T. solium proteome TsM_000544100 is most suitable for future vaccine exploration, however this needs to be validated by wet-lab experiments

E-P: PARAFILM AS AN EFFICIENT TRANSPORT MEDIA FOR CORNEAL SCRAPINGS

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Introduction: *Acanthamoeba spp.* are free-living parasites increasingly implicated in causing keratitis. Diagnosis of *Acanthamoeba* keratitis involves direct demonstration of the parasite in the corneal scraping by microscopy, culture in Non nutrient agar (NNA) medium or molecular detection of DNA. Corneal scrapings are usually transported to laboratory smeared between glass slides which are suitable for direct microscopy but unsuitable for culture and molecular tests which are more sensitive for parasite detection. Moreover, the delay in transporting the specimen to laboratory decreases the sensitivity of parasite detection.

Aim- To explore the usefulness of parafilm for transporting corneal scrapings to the laboratory.

Methods: One cm square pieces of Parafilm (referred to as PS) (Bemis Company Inc., USA) were sterilised with 70% ethanol and exposed to UV light for half an hour were used in the study. Each of the four different dilutions of *Acanthamoeba* suspension (15, 30, 60, and 120 cells/500µl) was added onto the surface of nine PS's, and kept at room temperature in sets of three for 24hr, 48hr, and 72hr incubation. One PS from each set of three PS's for one particular time point and dilution was used for microscopic examination by calcofluor staining; inoculation on NNA, and DNA detection by PCR.

Result and Conclusion: All three diagnostic techniques viz. microscopy, culture and PCR detected the presence of all the tested concentrations of *Acanthamoeba* suspension inoculated onto the PS and incubated for 24hr, 48hr, and 72hr. However, the growth pattern changed with respect to the incubation time and the parasite concentration. Thus, the parafilm squares proved to be suitable for maintaining the viability of *Acanthamoeba* during transportation for microscopy, culture, and PCR and can be used as a transport medium for corneal scrapings from AK patients.

E-P: BACTERIAL MICROFLORA ASSOCIATED WITH THE AMEBIC LIVER ABSCESSES: PREDOMINANCE OF *PREVOTELLA* IN THE RECURRENT CASES.

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Background- The mortality due to infections by *Entamoeba histolytica* is mainly because of the extra-intestinal manifestations, among which amebic liver abscess (ALA) is the most common one. Recurrence of ALA cases is uncommon and data regarding follow-up of the ALA is scarce. *E. histolytica* is selective in its association with the bacterial population which in turn often aids in virulence. The methods used for isolation and identification of the associated bacteria in the liver abscesses are not clearly specified and inadequate.

Methods- Total 108 confirmed cases of ALA were included in the study and followed for a period of 2 years. Freshly collected liver aspirates were subjected to aerobic culture on Blood agar media and Mac Conkey's agar media. For the detection of associated anaerobic microflora conventional PCR targeting seven predominant genera of anaerobes were included in the study. '**Recurrence'** was defined as cases who initially responded to treatment by complete resolution of the abscess confirmed through ultrasonography and laboratory tests but had subsequently developed ALA during the study period.

Results-Among the 108 *E. histolytica* positive cases, 61 (56.4%) cases showed the presence of associated microflora. Out of these, 7 (11.4%) cases showed the presence of aerobic microflora while 54 (88.5%) cases were screened positive for the targeted anaerobes. Among the anaerobes, 40 (74%) cases were monomicrobial and 14 (25.9%) cases were polymicrobial in nature. The most common anaerobes were *Fusobacterium* (27.1%) and *Peptococcus* (27.1%). Nine patients (8.3%) showed recurrence within the study period. The recurrent cases showed the presence of only *Prevotella* in five (55.5%) of the cases and no growth was seen under aerobic conditions in this group.

Conclusions- *E. histolytica* trophozoites coexist with varying bacterial populations, and anaerobes are majorly associated with this parasite. The presence of *Prevotella* was significantly associated with the recurrent cases of ALA ($p = 0.0064$).

OP-PREVALENCE OF GIARDIASIS AMONG THE IMMUNOSUPPRESSED PATIENTS ATTENDING A TERTIARY CARE CANCER INSTITUTE IN WESTERN INDIA

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Background: The flagellated diplomonad protozoan *Giardia duodenalis* is the most common species of the genus *Giardia* infecting various mammals, including domestic animals and humans. Cancer patients; due to their immunosuppressed condition present a favourablemilleu for the infestation of this opportunistic parasitic infections leading to hyperinfection and serious morbidity. A prevalence rate of 0.4-30% is estimated for *Giardia* infection in immunocompetent hosts, while the data for the immunosuppressed cancer population is not available for the same. Hence this study was conducted to find out the prevalence at our Center.

Methods Retrospectively analysis of prospectively maintained database in the department of microbiology was conducted for a period of five years from 1st November 2016 to 31st October 2021.Faecal samples of a total of 2185 immunosuppressed patients (malignancy, immunosuppressive therapy, transplantation) were included in the study. Microbiological data regarding macroscopic (colour, consistency, blood, mucous, worm) and microscopic examination of the stool specimen was noted. Stool microscopy to observe parasitic infestation was performed by direct wet smear technique with saline and iodine preparation. Clinical data in reference to the symptoms like diagnosis, duration of chemotherapy, diarrhoea, abdominal pain and fever were noted from individual patient record available from the Electronic Medical Records System.

Results- Of the 2185patients included in the study, giardia duodenalis was present in 29 (1.32%). The highest prevalence of giardiasis was found in patients with Haematolymphoid cancers ,65.51% (19/29). Overall, 50%patients showed diarrhoea as their major gastrointestinal symptoms.68.9% (20/29) were males and 31%(9/29) females respectively. Median age of affected people was 39 years. Chemotherapy was being received by patients with giardiasis for a mean duration of three years. All patients were relieved of giardiasis after administration of Tab metronidazole.

ConclusionThis study demonstrates a mild prevalence of giardiasis in the immunosuppressed population at our center. Also it highlights the importance of testing for intestinal parasites in immunosuppressed patients as they might become a cause for major morbidity in these patients.

OP- TITLE- FECAL MICROSCOPY – "ARTIFACTS (UNREAL)" OR "FACTS (REAL)"

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A lot of structures appear like parasites but aren't. In microscopy, artifacts and confusers are two categories of structures that are the most often present in stools samples. This is considered to be one of the greatest challenges faced by microbiologist in recognition of unusual vs the unreal; that is , the artifact , especially in the geographical locations where parasitic infections are scares. It may be perplexing to see free living organisms in stool, which is often influenced by specimen interactions with water, waste, or soil. For example Pollen grains, Vegetable Cells, Vegetable Spirals, Plant hair, Plant materials, Crystals and host cells like WBC, Clumped or fused RBC, Epithelial cells may be confused or mis-diagnosed with eggs and cysts of parasites, where as Free living Amoeba, flagellates ciliates and nematodes are the examples of perplexer. Though depending on the Geographical distribution there are many variations shown by different parasites and their infestations the major problem in parasitic identification is distinguishing the various stages of parasites from elements normally found in feces is a –dauting task|. Hence here I present few frequently encountered artifacts of stool microscopy and how to understand the difference between real and unreal for the benefit of patients and also help physician treatment as stool routines microscopy still takes a good stand as a –POINT of CARE| test.

OP- A CLINICAL, RADIOLOGICAL AND SEROLOGICAL STUDY OF NEUROCYSTICERCOSIS PATIENTS

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BACKGROUND

Cysticercosis caused by *Taenia solium* is listed by WHO as a Neglected Tropical Disease. It causes about 30% of acquired epilepsy cases in endemic countries. The serological assays are not adequate for the diagnosis of NCC and provide varied results depending upon the type of assay and the type of cyst, viz., location and number of the cyst/s. We studied the clinical and serological findings of 105 radiologically confirmed NCC patients.

METHODS-

A total of 105 radiologically confirmed NCC patients were enrolled. Their clinical presentation and radiological findings (CT/MRI) were recorded. The detection of specific IgG antibodies against *T. solium* was performed by a commercial ELISA kit.

RESULTS-

Of the 105 patients, 93 (87.6%) presented with seizures, 77 (73.3%) with headache, 21 (20.95%) with raised intracranial pressure, 19 (18.1%) with focal deficits, and 11 (10.48%) each with visual changes and psychiatric symptoms. Radiologically, 64 (62%) had single cysts, 12 (11.5%) had two cysts and 27 (26%) had multiple cysts. Among patients with single cysts, 39% patients were positive by ELISA, 13% had equivocal results, while 48% were negative; among the patients with two cysts, 33% were positive with ELISA, 25% were equivocal, and 42% were negative; among patients with multiple cysts, 52% were positive with ELISA, 22% were equivocal, and 26% were negative.

CONCLUSION-

In this study, we found a predominance of single and parenchymal cysts. The frequency of all symptoms was higher in people with multiple cysts. Serology yielded more positive results in multiple cysts as compared to single cysts, and is likely to miss NCC cases if not supported by radiology.

OP: THE INCIDENCE OF MALARIAL PARASITES IN SCREENING OF DONATED BLOOD FOR TRANSFUSION

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Background: Transfusion-transmitted malaria is still a problem in malaria endemic countries like India. Therefore, it is necessary to screen every donor through proper laboratory test to limit the incidence of post-transfusion malaria. Malaria is usually confirmed by microscopic examination of blood films or antigen based-Rapid Malaria test (RMT) but their sensitivity and specificity are still debatable. Many resource -constrained settings use a single test for blood screening, which may increase the risk of transmission of malaria parasites to blood recipients and the chance of clinical disease development. Objective of the study to determine the incidence of malaria among blood donors by microscopy and Serological tests (RMT and ELISA).

Materials and Method: A total of 4413 samples from blood donors were included in the study. All the samples were examined using Giemsa-stained microscopy (thick and thin smear) and Serological tests RMT (pLDH based PAN card) and ELISA for malaria parasites.

Results: Out of 4413 blood donors, Malaria parasites were detected in 7 by microscopy, 27 by RMT and 28 by ELISA. Sensitivity and Specificity of RMT card was 96.42% and 99.27% respectively. Plasmodium vivax was found to be the commonest (22 out of 27). All the positive blood donors were recall for history and they had positive history regarding Malaria or fever like illness in more than 3 months.

Conclusion:The findings point to the possibility of blood transfusion-transmitted malaria, which poses a significant risk to blood recipients. It is important to screen blood donors for malaria parasites so that measures can be put in place not to transfuse to high-risk patients such as pregnant women and children. Also, transfusion transmitted Malaria can be reduced by using an appropriate blood donor deferral strategy and testing measures.

OP: PREVALENCE OF *TOXOPLASMA GONDII* IN PIGS AND CATS FROM CHANDIGARH REGION, INDIA

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Background: Toxoplasmosis is paradigmatic of the One Healthapproach and this disease burden in the world is ranked among the highest of all parasitic diseases. We currently have no systematic way of determining the prevalence of *Toxoplasma* in the food chain as it can be picked up from contaminated soil, surface water, feed or infected rodents. A national survey in India on *T.gondii*infection in humans showed 24% of seroprevalence with the highest percentage in Chandigarh. With this background the **aim of the present** study was to assess the prevalence of *Toxoplasma gondii* in pigs and cats of Chandigarh region.

Materials & Methods: Samples of pig‘s ham muscle (n=100) were collected from Municipal slaughterhouse located in Industrial Area phase I of Chandigarh. Additionally, cat feces (n=20) were collected from felines in hostel, hospital and surrounding area. For the detection of *Toxoplasmagondii*, specific *B1* gene conventional PCR was done in all samples.

Results: The prevalence rate of *T.gondii* in pig‘s came out to be 29% with 29 out of 100 samples positive. Moreover 12 out of 20 cat‘s feces samples were positive for *T.gondii* (60% prevalence rate). We also observed seasonal variation in positivity rate for pigs in which highest number of samples came positive in rainy season (41%) followed by winters (27%) and summer (18%).

Conclusion: The results of this study shows quite high prevalence rate of *Toxoplasma gondii* in pigs and cats from Chandigarh region which clearly indicate that to reduce the disease burden of toxoplasmosis in humans, interventions are needed in the animal reservoirs. Also, high positivity rate in rainy and winter season indicates that moist and cool conditions can increase the oocyst survival thus leading to increased infection.

OP: PREVALENCE AND DETECTION OF MALARIA AT A TERTIARY CARE HOSPITAL IN WESTERN MAHARASHTRA, INDIA

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BACKGROUND

Malaria is a major global public health problem in most of the tropical and sub-tropical regions. India bears the largest burden of *P. vivax* malaria cases globally with over 3.6 million cases (48% of global *P. vivax* malaria cases) occurring in India.The objective of this study was to assess the prevalence of malaria infections among patients presenting to tertiary care center.

METHODS

This hospital based retrospective study was conducted at a tertiary care hospital in Maharashtra for a period of 1 year (September 2020-October 2021). A total of 3911 clinically suspected cases of Malaria were included in the study. All samples were tested by Rapid diagnostic test (*P. falciparum* specific histidine rich protein-2 (Pf.HRP-2), and *P. vivax* specific pLDH and peripheral blood film (PBF) for microscopy.

RESULTS

Out of 3911 clinically suspected cases 32 (0.81%) were positive for malaria. Prevalence of malaria was more in males (0.51%) as compared to females (0.30%). *Plasmodium vivax* was predominant (62.5%) followed by *Plasmodium falciparum* (37%). Mixed infections by *Plasmodium vivax* and *Plasmodium falciparum* (9.37%). Malaria prevalence is found to be more in 21-30 years age group. All patients that tested positive to microscopy also tested positive to RDTs based on antigen.

CONCLUSION

Our study shows a progressive decline in the number of positive malaria cases in our area. Although peripheral blood microscopy remains the gold standard for diagnosis of malaria, RDTs can also be used in routine diagnosis especially in remote areas with low resources. They are rapid, easy to perform and help in early diagnosis preventing further progression to the severe disease. The peripheral blood smear microscopy is recommended for accurate species classification and parasite quantification.

OP: PREVALENCE OF INTESTINAL PARASITIC CO-INFECTIONS IN COVID-19 PATIENTS.

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Background: Severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) primarily causes Respiratory dysfunction but may also cause gastrointestinal symptoms. The co-infection of parasites in patients with COVID-19 infection has been reported. But data regarding prevalence, etiology and outcomes of intestinal parasitic co-infections is limited. Thuswe aim tostudy intestinal parasitic co-infections in patients with COVID-19.

Material and methods: This was a prospective study which was carried out in the department of Microbiology in association with Rajdhani Covid Hospital for a period of 5 months i.e. from June 2020 to October 2020. The patients positive for COVID-19 by RT-PCR were included. Demographic details and history of illness was noted in a proforma. Stool samples were collected and screened by microscopy (wet mount and iodine mount). Staining for opportunistic parasites (modified Trichome stain and modified Kinyoun stain) was done after concentration. Patient investigation details were collected from the HIS.

Results: A total of 44 patients were positive by RT-PCR for COVID-19. Thirty eight (86%) and 6 (14%) out of 44 were males and females respectively. Forty (91%) patients were symptomatic for SARS-COV-2 and 4(9%) out of 44 were asymptomatic respectively. The mean age of patients was 51.95 years ± 2 S.D. Twenty seven out of 44 patients received Ivermectin as a part of treatment protocol for COVID-19. Saline and Iodine mount were negative for cyst, trophozoites and helminthic ova. Modified Kinyoun staining was negative for oocysts of *Cryptosporidium, Cyclospora* and *Cystoisospora*.We did not find any parasitic infections in any of these patients.

Conclusion: In our study we did not find any parasitic co-infections. This may be due to treatment with Ivermectin. Further studies are warranted to gain further insight into co-infections with COVID-19

OP: FASCIOLIASIS AS A CAUSE OF MELENA & JAUNDICE: NOT A VERY RARE ENTITY

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Case report: A 40 year old presented to the gastroenterology OPD with complaints of on and off pain abdomen with altered bowel habits for past 6 months. From last 2 weeks, the symptoms got aggravated and black stool passage was noted by the patient. He got admitted in the gastroenterology ward and investigative work ups are done. Routine radiology in the form of USG-upper abdomen was within normal limit. Stool sample was sent to the microbiology department for routine microscopy. Blackish semisolid stool was received which on direct mount (both normal saline & iodine), eggs are seen resembling *Fasciolopsis* spp. *The parasitic infestation report was intimated to the clinician. Based on the report, later on, ERCP was performed which detected the adult trematode in the common bile duct. Anti-parasitic drugs were started and the patient was getting cured as symptoms were started decreasing. Repeat sampling was negative three times before the patient got discharged.* Thus, the case recovered completely after timely diagnosis and treatment.

OP: DYSENTERY IN HOSPITALIZED PATIENT DUE TO *BALANTIDIUM COLI:* A CASE REPORT

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Introduction- Balantidium is the largest and the only ciliated protozoon to infect humans. Balantidiosis a zoonotic disease. Pigs are the natural host and humans acquire this infection via fecal-oral route.In the developing countries asymptomatic disease is a major problem as the water sources can be contaminated with porcine or human feces.living In urban areas*B.coli*can become an opportunistic parasite in, immunosuppressed hostswhere consumption of porkis not a factor. This case report deals with patient who developed*Balantidium coli* on her 32nd day of admission while being fed by Ryles tube.

Case- 44-year-old female known hypertensive, diabetic and old CVA in 2014 with bilateral ICA stenosis not on antiplatelets presented with right sided weakness and aphasia.Patients had episodes of fever and loose stools after a month of hospitalization.Stool sample was sent for Microbiological investigation. The stool bacterial culture was negative but wet mount preparation showed presence of numerous motile trophozoites with few RBC‘s and numerous WBC‘s which was suggestive of *Balantidium coli.* The occult blood waspositive, eosinophil count was $0.04x10^3/\mu L$ and hemoglobin levels were 9.8g/dl. Patient was fed with the help ofRyles tube during the hospitalization.Metronidazole was started for the patient and thesymptoms resolved, and she was discharged.

Conclusion

In institutional populations,outbreaks are due to asymptomatic carriers as consumption of pork is an unlikely source of infection. The difficulties involved in maintaining hygienic conditions also plays an important role. In conclusion patients institutionalized over a long period of time developing loose stools and fever should be investigated for *B.coli.*

KEY WORDS: Parasitic dysentery

OP: INTRACTABLE DIARRHOEA DUE TO CO-INFECTION WITH *CYSTOISOSPORA BELLI* AND *TRICHURIS TRICHIURA* UNRAVELLING A SEVERELY COMPROMISED IMMUNE STATUS

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Background:*Cystoisospora belli* is an obligate intracellular coccidian parasite known to cause chronic persistent diarrhoea in immunocompromised individuals such as HIV infection, long term corticosteroid therapy and cancer chemotherapy. *Trichuris trichiura* is a soil transmitted helminth, which predominantly causes asymptomatic or mild infections but heavy worm load lead to chronic diarrhoea, tenesmus or rectal prolapse. However, in patients with compromised immune status, even a low load of *Trichuris trichiura* may lead to diarrhea. We report a case of Co-infection with *Cystoisospora belli* and *Trichuris trichiura* in an adult patient causing intractable diarrhea, which led to unraveling of a severely compromised immune status.

Case report:-A 41-year-old man, goldsmith by occupation, presented with 8-10 episodes of severe watery painless diarrhea for past 2 days. Further history revealed that he was having persistent painless, watery and foul smelling loose stools for past 4 months (4-6 mild episodes/day) and associated with occasional bilious vomiting. He had a significant weight loss of 12 kg in last 3 months. Patient was known diabetic and chronic alcoholic for past 10 years. Stool microscopic examination revealed numerous oocysts of *Cystoisospora belli* both in saline wet-mount and modified acid fast stain preparation as well as the barrel-shaped, bile stained ova of *Trichuris trichiura* (2-3/coverslip). Subsequently he tested reactive for anti-HIV-1 antibodies and Hepatitis B surface antigen.The patient was treated with high dose Cotrimoxazole, and albendazole for 10 days for his diarrheal symptoms. He was also counseled and started on highly active antiretroviral therapy for HIV status and tenofovir therapy for Hepatitis B infection. Symptoms improved within one week of therapy. He was advised for regular follow-up on discharge.

Conclusion: Symptomatic co-infection with *Cystoisospora belli* and *Trichuriustrichiura*should raise a suspicion of an underlying immunocompromised status and investigations for the same should be done.

OP: A RARE CASE OF UROGENITAL MYIASIS IN YOUNG FEMALE SEEKING TREATMENT FOR INFERTILITY.

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Background: Myiasis is a parasitic infestation of vertebrate animals caused by the eggs and larvae of flies within the Diptera species typically lives in tropical or subtropical regions and usually appears during the summer and can manifest in various body parts, such as the eye, nose, ear, skin, gastrointestinal system and urogenital system. Psychodaalbipennis can thrive in the environment of a moist bathroom and may cause urogenital myiasis in humans. **Method:** A 33-year immunocompetent, non-diabetic house wife residing in posh locality of city was asymptomatic 8 months back & was consulting Gynaecologist for infertility. One day she noticed small 4-5 motile worm of 3-4 mm diameter in urine. Apart from dull aching lower abdominal pain & increase frequency of micturition she did not have any other urinary complaint. **Results:** Physical examination, blood and urine examination, stool microscopy revealed no pathology. No growth was detected in urine culture & multiple sonography reports were normal. Initially, she was diagnosed and treated for Trichomonas vaginalis with metronidazole, which did not provide any relief. One of the Private Microbiology laboratory misdiagnosed the excreted worms as Schistosoma hematobium, for which she was treated with oral praziquantel. . Symptoms reappeared again. This time the sample was brought to our hospital & was diagnosed as urogenital myiasis by careful observation of microbiologist. The opinion of doctors at Bombay veterinary hospital and entomologist was sorted for identification of the species. **Conclusion:** This case is presented to draw attention to myiasis and that it can be observed in individuals with a favorable hygiene and high socioeconomic status. If a detailed history is not taken and appropriate laboratory tests are not performed, the diagnosis may be missed

OP: EXTRA-INTESTINAL STRONGYLOIDOSIS : A CASE SERIES FROM A TERTIARY CARE HOSPITAL IN EASTERN INDIA.

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Background and objectives: *Strongyloidesstercoralis*is a nematode that causes disease in humans throughout the world. It commonly causes erythematous rash at the entry site, abdominal pain, diarrhoea and anorexia. In people with compromised cell mediated immunity, it can cause Hyperinfection syndrome and disseminated disease. Disseminated disease are mostly seen to present with gastrointestinal or respiratory symptoms. It is often fatal in immunocompromised patients. We aim to describe a series of 7 cases of extra-intestinal strongyloidiasis for academic interest.

Methods: Patients whose specimens (other than stool samples) were positive for Strongyloidiasis were termed as suffering from extra-intestinal strongyloidiasis. *Strongyloides* larvae was identified during gram staining, acid fast staining and wet mount examination. The available medical records/charts and microbiology requisition forms of these patients were reviewed for relevant clinical details and results of other microbiological investigations.

Results: Of the seven patients, 6 were male and one was female. They were in the age group of 25 years to 65 years. Samples positive for *Strongyloides* larvae consisted of – respiratory samples (3 patients), skin biopsy (3 patients), and duodenal biopsy (1 patient). An underlying disorder was identified in (%). Death occurred in one patient (mortality rate 14.3%).

Conclusion: Hyperinfection syndrome and disseminated disease due to *Strongyloidesstercoralis* can present as unusual and extraintestinal manifestations. A high index of suspicion and timely diagnosis can prevent untoward outcomes in these patients.

OP: ANCYCLOSTOMA CEYLANICUM INFECTION: A NEGLECTED PARASITIC ZOONOSIS

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BACKGROUND

Intestinal hookworm diseases are often caused by *Ancyclostoma duodenale* and *Necator americanus* but recent molecular based surveys in Asia have demonstrated that *Ancyclostomaceylanicum* has also become an important emerging public health risk(1).

METHOD

A 50 year old headload worker presented with complaints of loose stools for 5 weeks to OPD. He was admitted and started on IV fluids and supportive treatment. No history of contact with pets. No history of similar illness in family. Lab investigations revealed a high absolute eosinophil count(AEC) 9780 and hemoglobin level 12gm. Diagnostic colonoscopy was done which showed numerous greyish white cylindrical worms in the large intestine. Colonoscopy specimen was sent to our lab and identified as Ancylostoma sp.

Further Endoscopy was done on the next day which revealed similar worm infestation of the small intestine as well.He was started on oral Albendazole, supportive treatment and was discharged 2 days later.

RESULTS

The colonoscopy specimen was sent to College of Veterinary and Animal Sicences, Wayanad, Kerala for further identification and was speciated as *Ancyclostomaceylanicum.* On further follow up, patients symptoms had subsided, repeat Colonoscopy was normal and AEC had come down to 1140.

CONCLUSION

Though it is traditionally assumed that hookworm infestations in humans are mainly due to *Ancyclostoma duodenale* and *Necator americanus*, the role of zoonotic hookworms cannot be ignored. Ancyclostomaceylanicum is known to be an endemic and widely distributed hookworm infecting dogs and cats in Asia, its contribution to human morbidity as a potentially zoonotic hookworm remains largely unexplored.

OP: LYMPHATIC FILARIASIS WITH CHYLURIA

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BACKGROUND: Filariasis is a parasitic disease caused by an infection with roundworms of the Filarioidea type most common in India being Wuchereriabancrofti (>90% cases). Transmission: Through Aedes, Anopheles, Culex mosquitoes. Culex quinquefasciatus is the most important vector of W. bancrofti. Adult worms reside in lymph nodes and lymphatics. The gravid female releases microfilariae which then enter general circulation through lymphatics Here we report a 35-year-old male who presented with milky urine with burning micturition diagnosed as having parasitic chyluria. The patient was initially managed with a trail of diethylcarbamazine (DEC) 6 mg/kg/day for 21 days and albendazole 400mg for 12 days. Intensity of chyluria significantly decreased. Chyluria was not completely cleared. This is suggestive of lymph-venous fistula that needed further investigations which the patient refused to do.

METHODS: A 35-year-old male patient staying in Thane slum area. The patient was apparently alright 8 months back when he noticed white colour urine associated with burning micturition since 1 ½ month. After consulting various private practitioners, he did not get any relief. He visited our hospital with complaints of Chyluria along with haematuria since last 7 days associated with burning micturition. History of Minimal scrotal swelling left > right. No evidence of inguinal lymphadenopathy. On scrotal examination showed bilateral hydrocoele. Further investigations were done to rule out the cause

RESULTS: • On USG pelvis and genitourinary tract, bilateral epididymo-orchitis was seen. • Wet mount of Urine sample was observed, there was accidental detection of motile larva measuring around 300 µm. Peripheral blood smear was examined which confirmed microfilaria.

CONCLUSION - Mission _Filaria free India seem to be far from reality because • There are lots of hidden/ undiagnosed cases all across country like ours. • Asymptomatic nature of disease, • Prolong incubation period and late manifestation of disease • Ubiquitous Mosquitoes all over India

OP: DETECTION OF A LOPHOMONAS, A RARE PATHOGEN IN BRONCHO ALVEOLAR LAVAGE: A CASE REPORT

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Introduction-Lophomonas infection is an emerging parasitic disease-causing respiratory infection. Although common in immunocompromised patient, it has been observed also in some immunocompetent cases.

Case-We report a case of a 45 years male presented with productive cough, fever and chest pain, with marked eosinophilia, and cavitary lesion in X-ray chest. KOH preparation and AFB Microscopy of broncho alveolar lavage (BAL) was negative. Direct microscopic examination of BAL accidently showed large number of living Lophomonas species with movement of flagella. Methylene blue and Giemsa Staining showed the plume of flagella and the nucleus. Patient was managed conservatively with metronidazole and get cured. It was concluded that patient presented with sign and symptoms of pneumonia must be evaluated for rare events also if patient not responding with typical management of pneumonia. We reported first case of this rare entity in Chhattisgarh state in an immunocompetent young Indian male.

Conclusion- Rare cases are need to be documented to understand the pathogenicity & incidence of the unusual pathogen like Lophomonas of which very sparse cases has been reported which will help in improving diagnostic methods, and promoting preventive measures against the rare parasite.

OP: CHANCE ISOLATION OF *ACANTHAMOEBASPP* FROM A POST-COVID PATIENT

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Background- A 32-year-old post-COVID female was admitted in All India Institute of Medical Sciences, Raipur with continuous watery discharge from nostrils which could not be sniffed back, intermittent fever and throbbing headache. Her CSF rhinorrhea continuously demonstrated *Acanthamoeba spp*in direct and cultured CSF rhinorrhea sample. There was no history of bath in ponds nor use of contact lens but the patient had a history of bath in swimming pool of his brother's mansion. CECT cisternography revealed a defect in right cribriform plate while brain parenchyma appeared normal

Methods & Results - The wet mount revealed many cells with amoeboid movements which contained a single nucleus placed centrally or slightly eccentrically. Gram stain revealed no bacteria and few pus cells whereas giemsa stain revealed many trophozoites and few cystic forms.

The CSF sample was inoculated in blood agar for routine culture of fungi and bacteria. The CSF sample was inoculated onto Non nutrient agar medium with *Escherichia coli* suspension in the well; after 24 hours, there was evidence of trophozoites with characteristic acanthopodia from the wet mount prepared from the well. Later cystic form with double wall appearance were also demonstrated. The number of amoebas demonstrated decreased with the CSF samples sent subsequently and the last CSF sample sent before the patient got discharged did not have any free living amoeba or pus cells

Conclusion- Early use of steroid in non-critical patients with COVID-19 has probably played role in increasing the unusual infections. The patient received prompt treatment and was mildly symptomatic throughout her period of stay.

OP:UNUSUAL AND INCIDENTAL PRESENTATIONS OF FILARIASIS IN PATIENTS IN ONCOLOGY SETUP IN EASTERN INDIA

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Background: Lymphatic-filariasis, considered globally as a neglected-tropical-disease. The primary-aim of this study is to bring out the unusual-presentations of filariasis in a tertiary-oncology-setting from the Purvanchal-region where it is least expected and hence may be missed or over investigated.

Methods:A retrospective-analysis of two-cases of filariasis encountered in Oncology-OPD of Tata-Memorial-Centre, Varanasi during the last-one-year period was done. Diagnosis of fiariasis was based on either a routine peripheral-blood-smear examination or by Immunochromatographic-card-test.

Results- Case -1: A 21-year-old-patient was referred from a private-hospital with complains of low-grade-fever for ten-days and leucocytosis-(TLC>60,000/cumm) to rule-out neoplastic etiology. Peripheral- blood-smear showed marked eosinophilia (AEC-50,000/cumm). As part of standard-work-up in oncology-settings for hyper-eosinophilic-syndromes, bone-marrow-studies (BM) were planned to rule-out reactive causes of eosinophilia. BM-aspirate-biopsy showed myeloid-preponderance of eosinophils without-dysplastic-changes. Serum-protein-electrophoresis showed normal-serum-IgE-levels. NGS-molecular-studies confirmed the absence of any mutations such as BCR-ABL, C-KIT. CT-scan revealed multiple-bilateral-ground-glass-density-nodules, suggestive hypersensitivity-pneumonitis. Meanwhile, immunochromatographic-card-test for filarial-antigen came positive.

Case -2: A 36-year-old male patient was diagnosed with left-lateral-tongue-squamous-cell carcinoma in our-hospital in July-2021. Considering stage-of-disease, he was planned for palliative-chemotherapy. Post-two-cycles of chemotherapy, he developed fever. Routine investigations as hemogram, microbiology cultures were found to be negative. The peripheral-blood-film screening showed the presence of multiple microfilaria, with central-row-of-nuclei conspicuously absent from the tip of the tail, typical of *W-bancrofti*. Both the above patients were referred to Medicine-department-BHU-for the treatment of fialriasis as our-institution does not deal with benign-conditions.

Conclusion: Thus, filariasis may be uniquely misidentified as extensive-workup for eosinophillia because of patient presenting in onco-care hospital. Our study showed that diagnosis of filariasis can be done at primary care and no need of referral to a cancer centre causing unnecessary agony and excessive expenditure for the patient. Also, of absence of eosinophillia and use of immunosuppressant drugs can be factor for hidden diagnosis of filariasis which should be considered in cancer center in endemic area.