

bone marrow in 30 patients. Lethal outcome in 1 patient despite specific treatment due to intestinal bleeding.

Conclusions: Armenia is one of the endemic country of leishmaniasis, where this infection is a huge problem especially in children under 1 year. Diagnosis and treatment in time prevented from complications and guarantee full recovery of the disease.

PP-193 In vitro evaluation of medium-chain saturated fatty acid (dodecanoic acid) on *Blastocystis hominis*

S. Hassan¹, H. Moussa¹, Z. Fahmy^{1*}, A. Mohamed¹.
¹Theodor Bilharz Research Institute, Egypt

Background: *Blastocystis* spp. is a prevalent enteric unicellular parasite that infects humans and a variety of vertebrates. Clinical resistance or treatment failure for some *Blastocystis* cases using the standard drugs have been reported. Dodecanoic acid (monolaurin), a natural product extracted from coconut oil, was found to have potent anti-microbial effect against lipid-coated viruses, bacteria, yeast, fungi and recently on some protozoa. The present study was carried out to evaluate the in vitro effect of monolaurin (ML) against *Blastocystis* spp.

Methods: In vitro incubation of the parasite with ML (200–1000 µg/ml), metronidazole (120 µg/ml) and 1% dimethylsulphoxide (DMSO; the vehicle solvent) was conducted for different time periods. Concentration of parasite cells/ml of culture was determined after incubation with drugs. Parasite viability was also assessed using Eosin–Brilliant Cresyl blue (Supervital stain) exclusion test. Ultrastructural changes of *Blastocystis* following incubation with drugs were studied using transmission electron microscopy (TEM).

Results: Dodecanoic acid (500 and 700 µg/ml) induced highly significant reduction of viability of *Blastocystis hominis* cells in culture after 2 hours incubation ($p < 0.01$). Higher concentration (1000 µg/ml) caused rapid death of the parasite and no viable cells were detected after 30 minutes incubation. Shrinking of *Blastocystis* cells was observed using direct microscopy $\times 100$ following incubation with monolaurin. TEM studies of *Blastocystis* cells displayed key morphological features of programmed cell death, viz., nuclear condensation and nicked DNA in nucleus, reduced cytoplasmic volume with maintenance of plasma membrane integrity.

Conclusion: The work may add to the development of natural drug therapy in which food supplementation may augment or replace, some of the standard chemotherapeutic agents employed in the treatment of *Blastocystosis* or other intestinal infectious diseases.

PP-194 Evaluation of ponytail antiparasitic activity of pomegranate juice, peels and leaves against *Giardia lamblia*

A. El-Shennawy¹, E. Ali¹, W. El-Komy¹, Z. Fahmy^{1*}, E. El-Wakel¹. ¹Theodor Bilharz Research Institute, Egypt

Experiments were carried out on hamsters, to investigate the possible effect of extracts of dried pomegranata on intestinal *Giardia lamblia* infection. Each hamster was injected orally by 10,000 *Giardia lamblia* cysts. Animals were divided into six groups: group (1) control infected untreated group. Group (2) infected and treated by metronidazole. Group (3) treated with extract of dried pomegranate (Leaves). Group (4) receiving extract of dried pomegranate (Juice), and Group (5) receiving extract of dried pomegranate (peels). Group (6) infected and receiving combined treatment of 1/3 dose metronidazole plus extract of dried pomegranate (Leaves). Three weeks post infection,

treatment was given for 3 days. Two weeks later the treatment, stool analysis was performed and cysts/gm stool were counted after scarification of all groups.

The highest trophozoite reduction (98.7%) was found in group (6) receiving combined treatment of 1/3 dose of metronidazole plus pomegranate (Leaves). Then group (2) were the reduction receiving metronidazole, 94.5%, followed by the group which was treated with extract of dried pomegranate (leaves), 88.56%, followed by group (5) (72.15%) and lastly group (4) (62.20%).

With combined treatment, complete repair of the intestinal cell projections as well as healing of the mucosa and the submucosa were noticed. On the other hand, metronidazole showed preformed effect on the structure of the intestinal mucosa.

By histology, healing of mucosal ulcerations, preserved villi and reduced chronic inflammatory infiltrate of the lamina propria were detected with combined therapy.

It was concluded that the best results were obtained following administration of metronidazole with pomegranate (leaves). This might be useful in endemic areas where people tend to develop drug to metronidazole resistance to the commonly used anti-*Giardia lamblia* preparations.

PP-195 Potential antiparasitic activity of pomegranate extracts against schistosomules and mature worms of *Schistosoma mansoni*: in vitro and in vivo study

Z. Fahmy^{1*}, A. El-Shennawy¹, W. El-Komy¹, E. Ali¹, S. Abd El-Hamed¹. ¹, Theodour Bilharz Research Inst

This study was designed to estimate in vivo and in vitro effects of pomegranate extracts on *S. mansoni*. The in vitro bioassay of *Punica granatum* (*P. granatum*) peels and leaves extracts was carried out using ascending doses. Viability of worms and schistosomules was examined using negative (DMSO) and positive (PZQ) controls.

This study revealed that *P. granatum* had significant effect on both adult *S. mansoni* worms and schistosomules reaching 100% death rate, 24 hours post exposure to extracted plant. Concerning the in vivo activity, *P. granatum* peels and leaves exhibited antischistosomal properties by the oral administration of either extract, in a dose of 800 mg/kg, 45 days post-infection and on 3 consecutive days; this dose was given following a pilot study to evaluate the highest safe dose. Parasitological parameters showed remarkable decrease manifested by high percentage of dead adult worm (77.30% and 72.2%) with either leaves or peels extract respectively. The tissue egg load also revealed marked reduction in both liver and intestinal ova counts. The percentage reduction of adult worms reached (90.9% and 55.4%) with extracted leaves or peels respectively, when *P. granatum* extracts were given 21 days post-infection using the same dose (800 mg/kg), denoting a high significant effect of leaves extracts on schistosomules. Electron microscopic examination of perfused adult worms, confirmed the parasitological results and revealed the effect of the methanolic extracts of *P. granatum* in inducing major ultrastructural alterations in the tegument and the male genital systems of the worms that lead to their death.

The leaves and peels extracts of *Punica granatum* could represent promising bioactive natural agents that deserve further investigation, with the aim of introducing novel anti-schistosomal agent.