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Serodiagnosis of Neurocysticercosis in Children with the Use of *T. solium cysticerci* Excretory Secretory Antigens by Elisa and Immunoblotting

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Background: Neurocysticercosis (NCC) caused by *T. solium (Tso) cysticerci* is a leading cause of seizures and epilepsy in the developing world and is an increasingly important health issue in Indian children. Although CT/MRI is considered as a gold standard for the diagnosis of NCC, because of its unavailability and high cost, its application was limited in the developing countries. The sensitivity and specificity of various available serological techniques was low in case of single cysticercus granuloma cases which is a more common feature in Indian children than multilesional neurocysticercosis cases. Excretory Secretory (ES) antigens have been proved as a better diagnostic antigen than crude soluble antigen in many parasitic infections. The present study was aimed to evaluate the ES antigens for antibody detection in serum by ELISA and immunoblotting for the diagnosis of NCC.

Methods: Serum samples were collected from 125 clinically suspected and radiologically proven NCC patients and 125 control subjects. The *Tso cysticerci* was isolated from the naturally infected pigs and cultured in RPMI 1640 medium and ES antigen was prepared by $(NH_4)_2SO_4$ precipitation method. The ES antigen was used in ELISA and immunoblot for the diagnosis of NCC in children.

Results: The sensitivity and specificity of the ES antigen ELISA was 61.6% and 76.8% respectively. In SDS-PAGE analysis of ES antigen, 29 antigenic fractions were identified in between the molecular weight 20—325 KDa. The analysis of immunoblot results revealed one highly immunoreactive antigenic fraction with the molecular weight of 74.9 KDa with serum samples. Out of 125 NCC and 125 control serum samples, the immunoreactivity of 74.9 KDa antigenic fraction was 67.2% and 28% respectively.

Conclusion: The study suggests that ES antigens appear to be the best diagnostic antigen than crude and other antigens available for detection of antibody in serum samples for the diagnosis of neurocysticercosis in children.

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Quantitative Study of Structure Activity Relationship (Q.S.A.R.) of Antimalarial Compounds Isolated from *Solanum nudum* and Derivatives Synthesis

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Malaria is the main parasitic desease, responsible for more than 300 million cases and more than two million annual dead, causing major human and economic losses. In addition, there are more than 2,400 million people at risk of contracting this infection according to a report of the Pan American Health Organization (PAHO). Colombia presents 195.719 cases of malaria. New alternatives for treatment of malaria are needed and one is searching new drugs from natural products.

A steroidal sapogenin (diosgenon) and five steroids compounds from the plant *S. nudum* have been isolated. They are similar to progesterone, with in vitro antimalarial activity and no mutagenic effect. This supports the need for additional studies of molecular design with methods as QSAR to recognize the structural and functional factors involved in the antimalarial activity of these compounds, by means of the synthesis of derivatives and analysis of relations it structures activity, jointly with in vitro antiplasmodial activity and cytotoxic assays that support to the potential antimalarial use as isolated steroids from *S. nudum*.

Diosgenone was modified (OH-1, Met-1, NB-1, PTSN-1, diosgenine, dicarbonilic diosgenine, and both reduced diosgenin and diosgenone). Also SN-2 was modified (diacetate, aldehyde, ketone-aldehyde, aldehyde-alcohol and alcohol-ketone). It was found that diosgenone derivatives had low toxicity similar to natural compounds, except for the dicarbonilic derivative (47 ppm vs. 100.9 ppm) and SN-2 steroid derivatives (924 ppm for natural steroid Vs 19.3. for the derivative Aldehido-ketone).

The antimalarial activity were also measured in vitro, using FCB-2 and NF-54 strains (chloroquine resistant and chloroquine sensitive, respectively) using incorporation of hypoxanthine [8—3] to compounds modified diosgenone and SN-2 were made. The antimalarial activity in vitro for diosgenone derivatives is less than the natural compound when replacing the carbonyl and antimalarial activity in diosgenin, which has no activity antimalarial after of addiction carbonyl group. An IC50 of 0.3 ppm for derivative diacetate SN-2 and 4.1 ppm for acetate present in the reaction of SN-2 compared to 222.8 ppm for natural compounds was found. All of SN-2 derivatives that undergone changes in their acetate functional group showed a better antimalarial activity than natural compounds.

These results demonstrate that the carbonyl group is necessary for the antimalarial activity of diosgenone, but repeat testing antimalarial activity associated with SN-2 using a different reactive oxidation is necessary to corroborate these results and a change in the functional group and not by contamination of the sample in the process of synthesis or purification.

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