## **Original Research Article**

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20174249

# Deworming among pre-school and school going children in a rural area: a cross-sectional survey

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Received: 01 August 2017 Accepted: 29 August 2017

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#### **ABSTRACT**

**Background:** Morbidity due to Soil transmitted helminth (STH) infections can be controlled at a reasonable cost by means of mass deworming using effective drugs. Deworming campaigns targeted at high risk groups, such as schoolage children, pre-school children and women of child-bearing age are the mainstay of the control strategy launched by WHO.

**Methods:** A small sector was surveyed on the National Deworming Day (NDD) to record the percentage coverage of children in pre-school and school going children. Children were observed for any of the adverse effects within 24 hrs of taking Albendazole.

**Results:** Out of the total of 1142 children in anganwadis and government schools of the study area, 993 (86.9%) received tablet Albendazole (400 mg) under supervision of teachers. Among these only 3 children (0.26%) reported with adverse effects like vomiting and dizziness.

**Conclusions:** The percentage coverage of children on the NDD was about 87%. Ministries of Health can set up efficient, safe delivery, monitoring and referral systems, in order to minimise the risk and maximise the benefit of periodic deworming and increase the percentage coverage in communities where soil-transmitted helminthiasis is endemic.

Keywords: National deworming day, Albendazole, Adverse effects

#### INTRODUCTION

Neglected tropical diseases (NTDs) are a group of communicable diseases, which mainly affect poor, rural communities in tropical and sub-tropical regions around the world. Soil-transmitted helminthiasis is an important NTD caused by infections with the nematodes Ascaris lumbricoides, hookworm (*Necator americanus* and *Ancylostoma duodenale*) and *Trichuris trichiura*. Around the globe, about 5.3 billion people are living in an area where soil-transmitted helminth (STH) transmission occurs. <sup>1</sup> India alone contributes nearly 25% to the total

global cases with 220.6 million children in need of preventive chemotherapy.<sup>2</sup> The World Health Organization (WHO) estimates that 220 million children between the ages of 1 and 14 are at risk of STH infection in India.

STHs and schistosomiasis infections are big burden to school age children in large parts of the world.<sup>3</sup> They can negatively affect their growth, intellectual development, and produce resistance to other diseases.<sup>4</sup> To prevent children from risk of parasitic worm infections, the Ministry of Health and Family Welfare (MoHFW) Government of India launched the National Deworming

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Day (NDD) as part of National Health Mission. NDD aims to deworm all children between the ages of 1-19 years through Government, Government-aided and private schools, and centres in order to improve their overall well-being, nutritional status, access to education and quality of life.<sup>5</sup>

Under this program, all school teachers and workers are provided training and resource material to actively administer the deworming drug (Albendazole tablets) at school and centres.

Albendazole have been widely used for STH and schistosomiasis control. However, though it is reported to be safe, it is important to monitor the events of side effects in the projects when widely used for MDA (Mass Drug Administrations). When side effects occur, they are typically a sign of high infection, which makes taking the treatment all the more important. With this background we planned a cross-sectional survey on the NDD in a small sector and to observe if any kind of adverse effects occur with intake of Albendazole.

#### **METHODS**

After obtaining ethical approval this study was conducted in a rural sector of southern district of Punjab which had a total population of about 12,948 (acc. to 2011 census). In this area government schools and anganwadis (AW) were targeted for the deworming programme on the National Deworming Day (NDD). School teachers and anganwadi workers were trained by the staff from the district education office and the district medical office, one week before the programme. They were guided regarding aims of the school health programme, the rationale for deworming, the presence of worms in the area, characteristics of the de-worming drugs, their safety and storage, administration of drugs and keeping a record of their distribution. Children aged 1-5 years of age were given the tablet at anganwadis and those between 6-19 years were given the tablets in their school, under supervision of respective teachers. All children those were present on the NDD (February 2017) were given 400 mg of Albendazole tablet (name of the tablets, unibazole) and those who were absent were given the same on the mop-up day. One of the authors collected data from all schools about the number of children dewormed on the NDD.

Children were observed for any of the adverse drug reactions (ADR), like headache, fever, cough, dizziness, diarrhea, stomach ache, or vomiting/nausea immediately after taking the medication or within 24 hrs of taking medication. A nodal medical officer was appointed in this sector to observe and tackle with any of the adverse drug reactions that occurred during this deworming program and made available the adverse drug reaction reporting form to be filled if any ADR occurs.

#### **RESULTS**

This cross sectional survey was conducted in a small sector located in the southern district of Malwa area of Punjab. This sector had a reported population of about 12,948. In this area a total of 10 schools were surveyed (Table 1) on the NDD, all were run by state government. These included anganwadis (2-5 years), government primary schools (class 1<sup>st</sup>-5<sup>th</sup>), middle schools (class 6<sup>th</sup> - 8<sup>th</sup>), high schools (class 6<sup>th</sup>-10<sup>th</sup>) and senior secondary schools (6<sup>th</sup>-12<sup>th</sup>).

Table 1: Number of government schools surveyed in a sector.

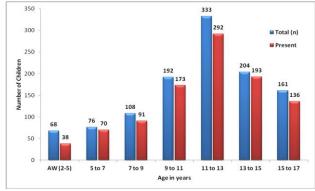
School	Number	Total (n) children
Anganwadis	3	68
Government primary schools	2	248
Government middle schools	2	93
Government high school	2	321
Government senior secondary school	1	412
Total	10	1142

Total strength of the children in these schools was 1142, out of which 993 (i.e. 86.95%) were present and received Albendazole on the NDD. More percentage of girls was dewormed as compared to boys (Table 2).

Table 2: Gender-wise distribution of children.

Gender	Total	Present	Received Albendazole (%)
Boys	663	561	84.6
Girls	479	432	90.1
Total	1142	993	86.9

Maximum numbers of children were in the age group of 11-13 years (Figure 1).



AW: Anganwadis

Figure 1: Age-wise distribution of children.

Out of the total 1142 children, 3 (0.26%) of them reported with adverse effects within half hour of

receiving Albendazole tablet. Among these 2 of them had vomiting and 1 reported of headache and dizziness. They were managed conservatively by the nodal medical officer present on duty at that time.

#### **DISCUSSION**

STH infections continue to plague large parts of the world with India a significant contributor to the burden of disease. Regions with high humidity and warm provide climatic conditions temperatures environment for the survival of parasite eggs in moist soils, incidentally highest prevalence of STH infections was reported from such region of Tamil Nadu, Andhra Pradesh, Bihar, Assam, and West Bengal.<sup>6</sup> WHO recommends periodic medicinal treatment (deworming) to all at-risk people, which includes preschool children, school-age children, women of childbearing age and those living in endemic areas. Treatment should be given once a year when the baseline prevalence of STH infections in the community is over 20%, and twice a year when the prevalence of STH infections in the community is over 50%. Punjab comes under the state of moderate prevalence of STH infection (20-50%). This intervention of preventive chemotherapy reduces morbidity by reducing the worm burden. The global target is to eliminate morbidity due to STH in children by 2020. This will be obtained by regularly treating at least 75% of the children in endemic areas.<sup>8</sup>

School-age children have particularly high infection rates and play an important role in spreading disease. Thus, WHO recommends periodic mass school-based treatments in areas where worm infections are above certain thresholds (WHO 2014). Mass school-based deworming involves administering deworming drugs to all children at their schools. The department of School Education and Literacy under the Ministry of Human Resource Development and the Ministry of Women and Child Development collaborate to implement the National Deworming Day (NDD). The fixed day strategy prioritises deworming within school health programs, increase awareness, and standardize campaign messages across the country.

In the present study 10 schools in a rural area were surveyed on the NDD having total strength of 1142 children, out of which 993 (86.9%) were present that day and received the deworming tablets (400 mg Albendazole). In our study area, percentage coverage of about 87% was seen which is comparable to the press information of the year 2015 given by Ministry of health and family welfare, Government of India.

The safety of anthelminthic drugs is of paramount importance and adverse effects have to be recognised and monitored, especially when generic drugs are widespread. Four anthelminthic drugs are considered to provide appropriate single dose treatment against soil-transmitted helminthiasis: Albendazole, Levamisole, Mebendazole

and Pyrantel. Adverse effects, at the dosage recommended for deworming, have been described as negligible and self-limiting. One of the author, who was appointed as nodal medical officer for the observation and treatment of any adverse drug reactions in the study area reported 3 children with ADR's (0.26%) after taking Albendazole. Among these 2 had vomiting within half hour of taking the tablet and one of them reported with dizziness. They were given conservative management and ADR forms were filled to be sent to ADR monitoring centers. Urbani in his study found transient abdominal pain, diarrhea, nausea, dizziness, and headache can occur occur occasionally with Albendazole. In a study by Njomo, stomach ache followed by cough was among the most common adverse effects with Albendazole.

#### **CONCLUSION**

In this study we found good percentage coverage of children on the NDD. Schools provide an efficient and effective channel to reach large portions of the population within a short time, which makes a programme cost effective. At the dosage recommended for deworming, school children experienced minor adverse effects, which were managed conservatively. Larger area covering a larger population of school going children in deworming programs can help limit the spread of STH infections.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the
Department of Rural Development and Panchayats,
Punjab

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Cite this article as: Gupta MK, Singla S. Deworming among pre-school and school going children in a rural area: a cross-sectional survey. Int J Community Med Public Health 2017;4:3777-80.