urbanisation are causing a “nutritional transition”. A rapid shift in the composition of diet (high fat), reduced activity and a consequent shift in the body composition characterise this transition.

The data shows that the nutritional status is largely influenced by the socioeconomic status. The students attending private schools are with a good socioeconomic status and their nutritional status had always been better than the students attending public schools. Those of national schools were well above their counterparts from non-national schools. National schools are a sector of public schools which have more facilities. Gaining admission to such schools is highly competitive, and mostly parents need to be from higher socioeconomic groups.

The mean Z score for height and weight closer to zero, for the children from private schools denoting the nutritional status of the children from higher socioeconomic status, matches with the NCHS standards.

Irrespective of the type of school or socioeconomic state, the feeding habits and behaviour patterns were not acceptable. Children in this study showed a more sedentary lifestyle with less time spent on physical activity and more time spent on watching television and attending tuition classes. Although the consumption of vegetables, eggs and milk was satisfactory, the consumption of fruits, fish and meat was low, perhaps it may be a reflection of the economic strength of the family.

With economic advances, a nutrition transition is occurring in our country. As a result, overweight and obesity prevalence is on the rise. This emerging public health problem may give rise to many diet related problems in the future. As economic advantages are not evenly distributed, undernutrition still prevails in the country to a significant degree.

References

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Comparison of one week and two weeks of triple therapy for the eradication of *Helicobacter pylori* in a Sri Lankan population: a randomised, controlled study

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(Index words: Clarithromycin, compliance, efficacy, tinidazole and omeprazole therapy)

**Abstract**

*Introduction* Resistance of *Helicobacter pylori* to antibiotics may be particularly high in parts of the tropics. Infection may prove difficult to eradicate in such situations, and there is some evidence of benefit in increasing the duration of treatment (triple therapy) from 1 week to 2 or 3 weeks.

*Aim* To assess the efficacy and tolerability of 1 week versus 2 weeks of triple therapy for eradication of *H. pylori* in a Sri Lankan population.

**Methods** Eighty two patients aged 18–70 years with gastritis or peptic ulcer and testing positive for *H. pylori* infection were randomly allocated to two treatment groups. Both groups received omeprazole 20 mg, clarithromycin 250 mg, and tinidazole 500 mg. Group A (n = 42) received the trial medication twice daily for 1 week and the Group B (n = 40) twice daily for 2 weeks. *H. pylori* eradication was defined as a negative ¹⁴C labelled urea breath test at 2 weeks after completion of the therapy.

**Results** *H. pylori* infection was eradicated in 36 (85.7%) patients in Group A and 36 (90%) patients in Group B

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and provides as good a rate of H. pylori eradication as 2

tinidazole, and omeprazole for 1 week is well tolerated

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Introduction

The pathogenic role of H. pylori in chronic active gastritis and its association with peptic ulcer disease are well established [1]. There is also evidence that H. pylori carriers are at an increased risk of developing gastric adenocarcinoma and lymphoma [1]. Eradication of infection with antimicrobial treatment heals peptic ulcers and substantially reduces the risk of their recurrence [2], and causes regression or resolution of gastric mucosa-associated lymphoid tissue, lymphomas [3, 4].

Eradication of H. pylori requires treatment with multiple drugs, most often two antimicrobial drugs supplemented with a proton pump inhibitor—triple therapy, usually for 1 week [5, 6]. In Sri Lanka, triple therapy is widely used. A large meta-analysis of 666 studies involving more than 50 000 patients [7] found no differences in eradication rates with different proton pump inhibitors (omeprazole, lansoprazole or pantoprazole) or nitroimidazole antibiotics (metronidazole or tinidazole). Of the macrolide antibiotics evaluated, clarithromycin was superior to others in the group [7]. However, partial or complete resistance to antibiotics is an important factor that affects H. pylori eradication, and this may be particularly high in parts of the tropics [8, 9]. Infection may prove difficult to eradicate in such situations, and there is some evidence of benefit in increasing the duration of treatment [7, 8]. Indeed, two studies from India have shown that the eradication rates increase from about 50% with 1-week treatment to over 90% with 2- or 3-week treatment regimens [10, 11].

In this randomised, controlled trial, we assessed the efficacy and tolerability of 1-week triple therapy with clarithromycin, tinidazole, and omeprazole against triple therapy with same drugs for 2 weeks in Sri Lankan patients.

Conclusion Twice daily treatment with clarithromycin, tinidazole, and omeprazole for 1 week is well tolerated and provides as good a rate of H. pylori eradication as 2-week therapy in Sri Lankan patients.

Methods

Patients

Patients were recruited from the medical and surgical out-patient clinics and wards of the North Colombo Teaching Hospital, Ragama. Consecutive patients aged 18–70 years with clinical and endoscopic diagnosis of gastritis or peptic ulcer disease and testing positive for H. pylori infection were included in the study. The presence of H. pylori infection was demonstrated by histology on gastric antral biopsies in all trial patients (combination of haematoxylin and eosin and toluidine blue stains). A rapid urease test (CLOtest—Bollard Medical Products, USA) was also performed. The histological examination was conducted by the same pathologist (JH) throughout the study.

Those who did not fulfill all inclusion criteria, had contraindication(s) to any trial medication, were suffering from chronic debilitating diseases (e.g. malignancy, diabetes mellitus, heart failure), and chronic alcohol abusers, patients on nonsteroidal anti-inflammatory drugs, pregnant or nursing women, and those who had used any of the trial medications during the preceding 2 weeks, were excluded from the study.

Patients were given verbal and written information about the nature, objectives, importance and expected benefits of the trial. They were told that they were free to withdraw from the study at any time if they wished, without any prejudice to subsequent management. Written informed consent was obtained in Sinhalese or Tamil. The Ethics Committee of the Faculty of Medicine, University of Kelaniya approved the study.

Patients included in the study were randomised by using a computer generated random allocation table into two groups (Group A and B). Both the groups received triple therapy, which consisted of omeprazole 20 mg, clarithromycin 250 mg, and tinidazole 500 mg (Pylobact™—Ranbaxy Laboratories Ltd., India). Group A received the trial medication twice daily for 1 week and the Group B received the trial medication twice daily for 2 weeks. Patients were asked to swallow all capsules and tablets whole and take the medication at the same time each day to improve compliance. They were asked to return any remaining trial medications when they returned for assessment of H. pylori eradication after completion of the treatment. Intake of less than 75% of the prescribed number of tablets and capsules was considered as unsatisfactory compliance. Patients were also informed about the possible adverse effects of the treatment and were advised to report any adverse events to the treatment. These were recorded by the trial physicians at follow up.

Assessment of patients

All patients returned for clinical assessment and pill counting 2 weeks after the conclusion of therapy. During this visit they were questioned about relief of symptoms and development of adverse events to treatment. Eradication of H. pylori, the primary efficacy variable of the study, was assessed by 14C labelled urea breath test (PYtest—Bollard Medical Products, USA) in all patients during this visit. H. pylori eradication was defined as negative 14C labelled urea breath test at 2 weeks after the completion of the therapy. The assessors were blind to the randomisation and other information regarding patients.
Statistical analysis

We expected the 2-week treatment to increase the eradication rate from 60% to 90%. Thus we calculated that a sample size of 76 was needed to give the study 80% power at $\alpha = 0.05$. We used SPSS (version 10) and did Fisher’s exact test to assess differences between proportions and evaluate confidence intervals using CIA (version 2.0.5.46). Analysis was by intention to treat.

Results

The study was conducted from October 2001 to June 2003. During this period 82 patients, who fulfilled the inclusion criteria, were randomly allocated to the treatment groups as described above; Group A $n = 42$, Group B $n = 40$. None of the patients dropped out from the study and all came for follow up after completion of therapy. Baseline characteristics are shown in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Therapy for 1 week ($n = 42$)</th>
<th>Therapy for 2 weeks ($n = 40$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex (%)</td>
<td>23 (54.8)</td>
<td>23 (57.5)</td>
</tr>
<tr>
<td>Age, mean years (SD)</td>
<td>50.7 (14.2)</td>
<td>49.7 (14.9)</td>
</tr>
<tr>
<td>Baseline tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLO test +ve (%)</td>
<td>13 (31.0)</td>
<td>11 (27.5)</td>
</tr>
<tr>
<td>Histology +ve (%)</td>
<td>42 (100)</td>
<td>40 (100)</td>
</tr>
</tbody>
</table>

Thirty six (85.7%; 95% CI 72.2–93.3) patients in the 1-week treatment group (Group A) and 36 (90%; 95% CI 76.9–96) patients in the 2-week treatment group (Group B) had negative $^{13}$C labelled urea breath tests at the end of the treatment. These patients were considered as cured of $H. \text{pylori}$ infection. The difference (4.3%) was not statistically significant ($p = 0.9$). The 95% confidence intervals for the two groups overlapped to a great extent.

Adverse effects

Twenty three (55%) patients in Group A and 17 (43%) patients in Group B reported adverse effects attributable to the medication. The difference in incidence of adverse effects in the two groups was not significant ($p = 0.387$). No serious adverse events were reported. The most common adverse event was abnormal or bitter taste sensation in the mouth. Others were nausea, vomiting, diarrhoea, headache, dizziness, increased thirst, dry mouth, and body aches. Three (7.5%) patients in Group B discontinued treatment because of adverse events that developed on days 7, 9 and 10. None in Group A discontinued treatment. Satisfactory compliance, defined as more than 75% of the prescribed drug intake, was noted in all patients except the three patients in Group B who discontinued treatment due adverse events.

Discussion

We report the results of a controlled trial, which assessed the efficacy and safety of 1 week versus 2 weeks of treatment with clarithromycin, tinidazole, and omeprazole (triple therapy) to eradicate $H. \text{pylori}$ in Sri Lankan patients presenting with gastritis or peptic ulcer disease. The study shows that increasing the duration of treatment from 1 to 2 weeks does not result in a significantly higher rate of $H. \text{pylori}$ eradication.

Our eradication rate of about 86% with 1-week treatment using a combination of two antibiotics and a proton pump inhibitor compares favourably with results from other studies which used similar 1-week regimens from Europe [12, 13], China [14], Turkey [15] and USA [16]. In these studies too, the eradication rate was not significantly higher with prolonged treatment compared to treatment for 1 week. In contrast, triple therapy regimens for 1 week in India have yielded low eradication rates ranging from 47% to 54% [10, 11]. This may be due to high level of resistance to nitroimidazole antibiotics, particularly metronidazole, reported from India [8, 9]. In the meta-analysis of 66 studies [7], it was shown that apart from different therapeutic regimens used, the only factor responsible for significant differences in cure rates was the nationality of the study population [7]. This finding suggests that epidemiological characteristics of patients and $H. \text{pylori}$ strains, principally antibiotic resistance, may be critical in determining the eradication rate in a specific population. A 1-week twice daily dose of a proton pump inhibitor and two antibiotics among clarithromycin, nitroimidazole, or amoxicillin is recommended in the UK and European guidelines [6]. Our study shows that similar recommendations may hold true for Sri Lanka as well.

Patient non-compliance to treatment is another factor associated with poor $H. \text{pylori}$ eradication rates [6, 7]. Eradication rates were lower in patients experiencing acute adverse events, seen more commonly in those receiving triple therapy for a duration longer than 1 week [17]. Although no serious adverse events attributable to the drugs used were reported during our trial, three patients in the group which received therapy for 2 weeks developed adverse events after 7–10 days of treatment, sufficiently distressing to warrant discontinuation of treatment. None in the 1-week treatment group discontinued therapy. Furthermore, 1 week of treatment halves the cost of therapy.

Demonstration of the organism by histology is now considered the gold standard for diagnosis of infection [18], particularly when the facilities for culture are either not freely available or not fully standardised. The rapid urease test seems to have a 95% sensitivity and specificity approaching 100% compared to the gold standards of histological examination or culture [18], and is the recommended test to detect $H. \text{Pylo}r i$ in clinical trial settings [6, 19]. However, there is a limitation to the use of urease testing in patients taking proton pump inhibitors,
high-dose H2-receptor antagonists, or antimicrobials, which might decrease H. pylori density and consequently urease activity, thereby producing a false negative result [18, 20]. Like in our study, high false negative rates have also been reported from India [21]. Widespread use of gastric acid suppressants and antimicrobials may be a reason. The 14C labelled urea breath test is considered the first-line post-treatment diagnostic test [6]. Here too there is a potential for false negatives in individuals receiving acid suppressant drugs, antimicrobials, or bismuth-containing compounds [18, 20]. In order to overcome this confounding factor we performed the 14C labelled urea breath tests on our patients 2 weeks after the completion of the therapy.

No therapeutic regime has achieved 100% efficacy for H. pylori infection. However, several regimens have been devised that attain eradication rates between 80% and 90%. Therefore, an ideal H. pylori eradication treatment regime must be safe, cheap and tolerable, with completion of the therapy.

Acknowledgements

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References

Abstract

Objective To determine the effect of exposure to metal dusts, fumes and high temperature levels among brass workers in comparison to a control group.

Study design Analytical cross-sectional study.

Methodology One hundred and fifty four brass workers were matched for age with 154 controls selected from the local population. An interviewer-administered questionnaire was used to determine the presence of acute and chronic symptoms and metal fume fever. Haemoglobin and blood zinc and copper levels were measured using the cyanmethaemoglobin technique and atomic absorption spectrophotometry respectively. Thermal environmental measurements were carried out by determining wet bulb and globe temperature (WBGT) levels and air velocity.

Results Among the chronic symptoms anorexia (OR = 3.3), distaste (OR = 8.3), and aches and pains (OR = 4.0) were significantly higher in the study group. Among the acute symptoms at work, cough (OR = 4.2), dry nose (OR = 6.8), tearing (OR = 6.3), and itchy eyes (OR = 6.3) were significantly higher in the study group. Sweating was significantly higher in the control group. Metal fume fever was significantly higher among the study group with an OR of 7.6. Levels of both copper and zinc were significantly higher in the study group, although both median and mean values were lower than the normal reference ranges. The recommended WBGT level of 26.1°C for an air velocity of less than 1.53 m/s for heavy work was exceeded only in two workshops.

Conclusions Prevalence of non-specific symptoms was higher among brass workers. It is necessary to take preventive measures.

Introduction

Brass is a metal alloy composed mainly of copper and zinc. In addition, it may contain metals such as tin, lead, iron, manganese, nickel and others. In the analysis of the scrap brass that is used as a raw material for the manufacture of brassware, the composition was found to be 6.9% copper, 26.9% zinc, 3.5% tin, 1.7% lead and a trace of iron.

The manufacture of brassware consists of several labour intensive processes described elsewhere [1]. The first is smelting of scrap metal which generates various metal fumes depending on the constituents of the metal alloy. Metal fumes may also be released during welding. Smelting requires high temperatures, exposing the workers to adverse effects of heat. Acute effects of exposure to metal fumes are irritation of eyes, nose and throat [2, 3].

Zinc is thought to give rise to numerous gastrointestinal (GI) symptoms such as gastroenteritis, and gastric and duodenal ulcers [4, 5]. Workers of copper and zinc refineries were reported to have significantly high cause specific standardised mortality ratios for cancer of the digestive and respiratory tracts and cerebrovascular disease [6].

A condition known to develop as a result of exposure to copper and zinc fumes is metal fume fever (MFF) [6, 7, 8]. It usually occurs few hours after exposure, when the worker resumes duty after being away from work. It is preceded by non-specific symptoms such as dry throat, metallic taste, cough, tightness in the chest and vomiting, followed by chills and rigours with a rise in temperature, which resolves by crisis a few hours later. It is accompanied by profuse sweating and the prostration may last several hours. The patient may fall into deep sleep and wake up weak but not incapacitated. However, it does not lead to long term complications [2, 7, 8].

Heat is a physical hazard encountered in foundries and gives rise to acute conditions such as cramps, heat exhaustion and heat stroke. Chronic heat illness may present as weakness, irritability, nausea, vertigo, impotence and gastric pain [9].

Non-specific occupational health conditions among brass workers at Gadaladeniya, Sri Lanka

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(Index words: Blood copper and zinc levels, metal fume fever)

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