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Review article ***Pharmacology***

Importance of antibiotics in cardiovascular diseases

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ABSTRACT

Cardiovascular diseases (CVD's) are the group of diseases of the heart and blood vessels the most common cause of the CVD's are atherosclerosis , (plaque build-up in the arteries)some of the CVD's are MI , IHD, coronary artery disease, valve disease, heart failure, aneurism.The Review focused on the effective use of antibiotics in CVD's in that we study about CVD's like CHD, MI and IHD so we find that the Chlamydiapneumonia may increases the risk of developing cardiovascular diseases . some studies shows that the Chlamydiapneumonia species may found in damaged vascular tissue and arteries of the heart and some of the bacteria like Helicobacter pylori , Cytomegalovirus , may also develop atherosclerotic lesions in that some of clinical trails shows that the macrolide antibiotics like Azithromycin, roxithromycin, oxithromycin antibiotics may shows a greater efficacy against Chlamydiapneumonia and they reduces the plaque stabilization but there is no proper therapy for killing of Chlamydiapneumonia in patients with CVD. But killing of an inflammatory condition in patients with CVD may reduces the risk of CVD's so several clinical trails are require to perform the proper and effective use of antibiotics in CVD's in this we study we tell about that there is an use of macrolide antibiotics may reduces or may cure the risk of developing the cardiovascular diseases .

Keywords: Antibiotics, Cardiovascular diseases, Helicobacter pylori, Chlamydiapneumonia

INTRODUCTION

In general, the cardiovascular diseases are more common in causing the mortality and morbidity [1-2] in all over the world. the smoking, drinking, hypertension, Diabetes, lack of exercise are relatable to risk of Cardiovascular Diseases [CVD] and some of the microorganisms which are involving causing infection specially CVD like Cytomegalovirus, Chlamydiapneumonia and Helicobacter pylori are showing more effects in CVD . Off course almost, most of the microorganisms related to infections are treated with ANTIBIOTICS [are the agents or medicaments which are used to kill or eradicate the growth of microorganisms].
The general type of CVD's are myocardial infraction, heart failures, coronary artery disease, valve disease, aneurism in heart cardia arrhythmias, cardiomyopathy, pericarditis. etc., [3] are having their own risk factors respectively, but of course which are linked each CVD condition{Angina and myocardial infarction are usually caused by a constricting of the lumen of the coronary arteries, resulting in partial perfusion to myocardial tissue.[4] This narrowing of the coronary artery lumen is known as atherosclerosis, a progressive accumulation of plaque, consisting of lipids, smooth muscle cells, inflammatory cells, and an extracellular matrix within the intimal layer of the arteries. Atherosclerosis is an inflammatory process that initiates when vascular endothelium, in response to various insults, recruits macrophages and T-lymphocytes into the arterial intima, forming a fatty streak. A substantial amount of clinical data evaluating the risk factors associated with the development of

atherosclerosis (i.e., diabetes mellitus, hypertension, hyperlipidemia, smoking, genetic disposition) is available; however, these factors may only partially explain the high prevalence of cardiovascular disease in the general population.[5]

there are importance of antibiotics to prevent further multi organ infections related to multi organ dysfunction and to reduce the chance to show type of infections. specially, in most of CVD, patients are getting the ill due to chronic infection along with the atherosclerosis and also if a patient having an atherosclerotic lesions which may ultimately leads to severe heart problems where the approved statement of Pasceri et al [6].Ultimately concluded that microorganisms plays a vital role in treatment of heart disease also seroepidemolo, pathology and animal studies are produces the enough evidence for possible association between the C.pneumoniae and Atherosclerosis, CVDS-,MI. In this associations produces that course of antibiotics produces positive effect after to acute ischemic cardiac effect which is takes as an secondary prevention but which tends to developing in the first time of myocardial infraction which takes as the primary prevention. so many clinical trails and preliminary evidences produces regarding the usage of macrolide antibiotics in the treatment of acute ischemic events as well as tetracycline's and quinolones are reducing the risk of first time myocardial infraction which is a proven study but current situation due to lack of updated knowledge. Antibiotics usage in treatment and/or prevention of ischemic heart disease must not recommended. However which leads to further complications.Finally we did not find any relation between the coronary syndrome and atherosclerosis is does not cause by only H.pylori because it is a long lasting bacteria in our body is usually acquiring from childhood finally causing a risk of atherosclerosis through H.pylori. H.pylori, Cytomegalovirus are mostly prevalent in patients with and without IHD. [7-9]

ABOUT CHLAMYDIA PNEUMONIA

C. pneumoniae is a bacterium which is identified in year of 1960, It is an obligate intracellular gram-negative bacterium that commonly causes upper respiratory tract infections and pneumonia in children and young adults, plus recurrent respiratory infections in older adults. Infection with C. pneumoniae is spread via inhalation through close personal contact. Macrolides, tetracyclines, and fluoroquinolones effectively inhibit C. pneumoniae.Theoretically, if presence of C. pneumoniae triggers the development of atherosclerosis and subsequent negative cardiovascular outcomes, antibiotic therapy directed against C. pneumoniae may reduce primary and secondary cardiovascular events [10]. it was identified in the in the patients with respiratory track problems and get isolated from the systemic tissue about 15 years ago [11-12] and identified as respiratory pathogen from there been a no.of studies are getting carried out, at one study shows high prevalence of development of antibody titers against the C.pneumoniea in the subjects with myocardial infraction [13] from there it self, the C.pneumoniea bacterium is introduced into the several types of CVD'S.

CHALMYDIA TESTING

There are significant controversy about best method for identification of a system indolent infection with C.pneumoniea. In which is for healthy people IgG titers is actually in relatively low predictive value and if they may be came to elevated after a clinical cure Iits about 50% prevalence of C.pneumoniea exposure in a general population. [14]

THE POSSIBLE ROLE OF ANTIBIOTICS FOR CHD AND MI

There is a possible relation between the C. pneumoniae and risk of developing CHD and MI. One can be expect that use of antibiotics for any kind of diseases that may be decrease the risk of developing the cardiovascular diseases.

A proper therapy for the killing of C.pneumoniae is not well established and both the invivo and invitro studies been going on and they made for the finding of concentration of the antibiotic to eradicate the bacterium through invitro studies and invivo studies are getting more tough, but the information from the in vivo studies are more important for a proper therapy .on the basis of available information till up to date, new macrolide antibiotics like azithromycin, roxithromycin and clarithromycin and tetracycline antibiotics like tetracycline, oxytetracycline, minocycline are showing a greater efficacy against the C.pneumoniae. where erythromycin producing an uncertainty, unless used in high doses for at least 2 weeks [15-20]. A patient with unstable angina or non Q – wave they both are randomly treated with roxithromycin against C.pneumoniea , IgG baseline tiers suggested that anti inflammatory action of roxithromycin may contributed to reduce plaque stabilization [21-23]. The quinolones like ciprofloxacin and norfloxacin are produces that some suggested activity towards C.pneumoniae and newer quinolone like grepafloxacin of course showing better activity but there is no larger patient data. Sulphonamides and b-lactam antibiotics like penicillin's, cephalosporin'sare considered not to be efficacious against C. pneumoniae [15-20]. It must, however, be emphasized again that a comparison of the relative effectiveness of various antibiotics is difficult because efficacy in vitro does not necessarily reflect clinical efficacy in vivo.

TREATMENT OF CHD AND MI WITH ANTIBIOTICS

Most of the efforts are made for the two clinical trials which are done on effect of newer macrolide antibiotics on the short – term outcome after an acute cardiac event [24-25]. The comparison of these studies is carried by one study completely focused on the improving the antibody titers against C.pneumoniae., and other study focused on the subjects who did not produce the antibody titers against the C.pneumoniae. Respectively, treatment with antibiotics started early after an ischemic event in one study [24] and at various points in the after an MI in other[25].

Gurfinkel et al. [24] treated patients who had unstable angina pectoris or non–Q-wave MI with placebo or/ and with roxithromycin (150 mg orally) twice a day for 30 days and thenanalysed the data after 1 month [24] and 90 and 180 days [26], respectively. The authors reported that statistically significant difference between the treatment and the placebo group after 30 days of follow-up: In the placebo group, there were 9 subjects with a triple end point i.e., severe recurrent angina, plus acute MI, plus ischemic death, and in the roxithromycin group, there was only 1 subject with a triple end point [24]. Of interest, this difference was weaker P =

.036 after 90 days (12 subjects in the placebo group and 3 in the roxithromycin group had triple end points,) and non- P = .058 significant after 180 days 14 subjects in the placebo group and 7 in the roxithromycin group had triple end points, P = .334 [26].

Gupta et al. [25] reported the findings of a clinical trial in which they included male subjects who attended a post-MI outpatient clinic. MI survivors were divided into three groups according to their level of IgG antibodies; subjects with the highest antibody titers were treated either with placebo or with azithromycin (500 mg/day) for 3 or 6 days. There was also aimportant difference between the treatment and the placebo groups in the number of repeated adverse cardiac events after a mean follow-up of 18 months. Subjects in the placebo group who had the highest antibody titers against C. pneumoniae had an4- times more increased risk of developing recurrent cardiac ischemia, compared with subjects with no increased antibody titers against C. pneumoniae.

Anderson et al. [27] randomized subjects with elevated antibody titers and CHD to take either placebo or a 3-month course of azithromycin. There was no change with regard to the clinical outcome (adverse ischemic cardiac events), but the treatment group had significantly lower inflammation markers (e.g. interleukin-6, C-reactive protein) than the placebo group [27]. These secondary prevention trials suggest that the newer macrolide antibiotics, azithromycin and roxithromycin, have some effect on inflammation markers or clinical outcome (or on both) after an acute ischemic cardiac event; however, these findings do not yet allow the inference that there is a causal involvement of C. pneumoniae in the outcome and the survival rate of CHD patients.

The results stated by Anderson et al. [27] and the final analysis of Gurfinkel et al. [25] provide evidence that the preferable benefits of effect of macrolide any be shorter and based on acute anti-inflammatory effects of these compounds rather than on antibiotic properties. Some of the antibiotics liketetracycline's or macrolides, have been shown to have pharmacologic effects beyond antibacterial efficacy, which are antioxidative effects and inhibitory effects on metalloproteinase [28-30], which in turn have been shown to be involved in plaque instability and rupture. Thus, inhibition of metalloproteinase may lead to stabilization of previously unstable atherosclerotic plaque and to an improvement of the clinical outcome of patients with unstable CHD independently of any antibacterial efficacy of these antibiotics [28-33].

RELATION BETWEEN THE IHD AND H. pylori BACTERIA

The patient who suffers from IHD have been highly infected H.pyloribacteria, in this we have to evaluated with the existing knowledge between the chronic inflammation and atherosclerosis [34]. And the use of the potential antibiotic therapy [35]. In these comparison they find that the low grade inflammation are mostly the exposure to the infective agents such as C.pneumoniea, cytomegalovirus , H.pylori might have chance to develop atherosclerosis lesions but the rational use of antibiotic therapy cures the H.pylori infection so, most of the people with H.pylori may suffers from IHD. So eradication of H. pylori infection may also prevent the IHD.

In this study they use the macrolide antibiotics for the prevention of IHD. first macrolide antibiotic produce anti-inflammatoryeffects .i.., e erythromycin in lungs seems to ameliorate neutrophil induced endothelial cell injury by effecting not only neutrophil function but they also release NO_2 from endothelial cells through the action of CAMP dependent protein kinase [36]. erythromycin has also been reported to modulates bleomycin induced pulmonary fibrosis and also supress tumour necrosis factor and platelet derived growth factor and they reduces accumulation of inflammatory cells in the lungs[37], in chronic sinusitis the macrolide antibiotics eradicate the WBC cells like macrophages and T–lymphocytes finally macrolide antibiotics are majorly used to treat inflammatory conditions in the body[38-39]. The reduce of an inflammatory condition they also beneficial for the cure of IHD in the Roxis et al [21-23] study.

CONCLUSION

The antibiotics usage in the cardio vascular diseases plays an important role and mainly the prevalence bacterium C. peumoniae is one of the main risk factor for the CVD's and treating in the bacterium is more important in the therapy in the CVD's to prevent further complications , as of know most of the hospitals using the antibiotics from various classes in the purpose of prophylaxis due to lack of an accurate the guidelines , but off course the studies have been going on and that this study might be help full to under standantibiotic activity on CVD's and finally hoping that a proper studies will be getting carried out and an accurate therapy will be provided to a patients with CVD's .

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