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Article

Association Between the Duration of Ischemic Heart Disease and Erosive Gastroduodenal Mucosal Lesions

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Abstract:

Aim. To evaluate the association between the duration of ischemic heart disease (IHD) and erosive gastroduodenal lesions detected by esophagogastroduodenoscopy.

Materials and methods. This retrospective cross-sectional study included 2,924 patients with IHD. Patients were divided according to disease duration into $\leq$1 year (n = 414) and $>$1 year (n = 2,510) groups.

Results. Gastric erosions were detected in 14.25% and 11.67% of patients, respectively, with no statistically significant difference (χ^2 = 2.23; p = 0.135). Univariable logistic regression also showed no significant association between IHD duration and overall gastric erosions (OR = 0.795; 95% CI, 0.588–1.075; p = 0.136), and no significant associations were found for solitary, multiple, antral, fundal, or duodenal bulb erosions. The association with overall gastric erosions remained non-significant after adjustment for age and sex.

Conclusion. IHD duration was not significantly associated with erosive gastric or duodenal lesions in this study.

Keyword: ischemic heart disease; erosive gastropathy; gastroduodenal erosions; endoscopy

Introduction

Ischemic heart disease (IHD) is a major cause of morbidity and mortality worldwide. In patients with IHD, the prevention of cardiovascular events frequently requires antiplatelet therapy and, in selected clinical situations, anticoagulant treatment. Although these therapies provide important cardiovascular benefits, they may increase the risk of gastrointestinal bleeding, particularly in patients with pre-existing gastrointestinal lesions or other risk factors [1,2,6,8,9].

Erosive lesions of the gastric and duodenal mucosa are clinically relevant because they may contribute to upper gastrointestinal symptoms and, in some patients, gastrointestinal bleeding. Low-dose acetylsalicylic acid has been associated with an increased risk of gastrointestinal bleeding, and the gastrointestinal safety of antithrombotic treatment remains an important consideration in cardiovascular care [3,8,9]. Current clinical recommendations emphasize individualized assessment of gastrointestinal and bleeding risk in patients receiving antiplatelet or anticoagulant therapy [2,6].

The development of gastroduodenal mucosal lesions is multifactorial. In addition to antithrombotic therapy, relevant factors include non-steroidal anti-inflammatory drug exposure, Helicobacter pylori infection, previous peptic ulcer disease, older age, and the use of gastroprotective treatment [5–7]. These factors may influence the risk of mucosal injury independently of the duration of the underlying cardiovascular disease.

The duration of IHD may reflect the chronicity of cardiovascular disease and may be associated with differences in patients' clinical characteristics and cumulative exposure to cardiovascular medications. However, the independent association between IHD duration and endoscopically detected erosive lesions of the stomach and duodenum remains insufficiently characterized. In particular, it is unclear whether patients with a longer duration of IHD have a higher prevalence of gastroduodenal erosions than patients with a more recently established diagnosis.

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Therefore, this study aimed to evaluate the association between the duration of ischemic heart disease (IHD) and the prevalence of endoscopically detected gastric and duodenal erosions in hospitalized patients with IHD. The study also examined whether this association varied according to the number and anatomical localization of gastric erosions and whether the association between IHD duration and overall gastric erosions persisted after adjustment for age and sex.

Materials and Methods

This retrospective cross-sectional study included 2,924 consecutive patients with an established diagnosis of ischemic heart disease (IHD) who were hospitalized at the Republican Specialized Scientific and Practical Medical Center of Cardiology, Tashkent, Uzbekistan. Clinical and endoscopic records from January 2017 to December 2018 were retrospectively reviewed.

During hospitalization, patients with clinical indications for upper gastrointestinal evaluation underwent esophagogastroduodenoscopy (EGD), generally on the second or third day after admission. EGD was performed to detect or exclude erosive and ulcerative lesions of the upper gastrointestinal tract and to assist in the clinical management and appropriate prescription of antiplatelet and anticoagulant therapy. The examinations were performed by experienced endoscopists using standard video endoscopes as part of routine clinical care.

The duration of IHD was determined retrospectively from the patient's medical records and calculated as the elapsed time between the date of the first documented diagnosis and the date of the index EGD. Patients were subsequently stratified into two groups according to disease duration: ≤ 1 year (n = 414) and >1 year (n = 2,510).

Erosive lesions were recorded using the terminology and endoscopic descriptors documented in the clinical records, which were interpreted according to the terminology of the World Organization of Digestive Endoscopy (OMED/WGO) and the classification proposed by Zdeněk Marřatka. The retrospectively available endoscopic variables included the presence of gastric erosions, the number of erosions (solitary or multiple), and their anatomical localization (antral or fundal). Erosions of the duodenal bulb were recorded separately as erosive duodenopathy.

Because this was a retrospective study based on routine clinical and endoscopic records, the availability and completeness of individual endoscopic descriptors depended on the original documentation. Therefore, the variables describing the number and anatomical localization of erosions were analyzed as separately recorded endoscopic characteristics and were not considered mutually exhaustive components of the overall gastric erosion variable.

Categorical variables are presented as frequencies and percentages. Differences in categorical variables between the IHD-duration groups were assessed using Pearson's χ^2 test. Continuous variables are presented as means and standard deviations (SDs), and differences between groups were assessed using the independent-samples Student's t-test. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated using binary logistic regression.

Univariable logistic regression was performed to evaluate the association between IHD duration and each endoscopic outcome. For the primary outcome of overall gastric erosions, an additional logistic regression model adjusted for age and sex was performed because these variables were available in the retrospective database and may act as potential confounders. The available database did not contain sufficiently complete information on antiplatelet or anticoagulant treatment, nonsteroidal anti-inflammatory drug use, proton-pump inhibitor therapy, Helicobacter pylori status, previous peptic ulcer disease, or comorbidities; therefore, these variables could not be included in the regression models. A two-sided p value <0.05 was considered statistically significant. Statistical analyses were performed using Stata/SE 17.0 (StataCorp LLC, College Station, TX, USA).

The study analyzed retrospectively collected clinical and endoscopic records from January 2017 to December 2018. Ethical approval for the retrospective analysis was obtained from the Ethics Committee of the Republican Specialized Scientific and Practical Medical Center of Cardiology (RSSPMC of Cardiology), Tashkent, Uzbekistan (Protocol No. 11, June 22, 2026). The Ethics Committee confirmed that the study was based on anonymized clinical and endoscopic data obtained during routine medical practice. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (2013 revision). Because the study used anonymized retrospective

data and involved no additional interventions, the requirement for written informed consent was waived by the Ethics Committee.

The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement.

Results

The study included 2,924 patients with IHD. The mean age of the study population was 60.59 ± 9.18 years (range, 26–90 years), and 1,919 patients (65.63%) were male. Patients with an IHD duration of ≤1 year were younger than those with an IHD duration of >1 year (54.14 ± 9.83 vs. 61.65 ± 8.62 years, respectively; $p < 0.001$). The distribution of sex also differed significantly between the two groups: males accounted for 79.23% of patients in the ≤1-year group and 63.39% in the >1-year group ($\chi^2 = 39.53$, $p < 0.001$).

Of the 2,924 patients, 414 (14.16%) had an IHD duration of ≤1 year and 2,510 (85.84%) had an IHD duration of >1 year. Overall gastric erosions were detected in 352 patients (12.04%). Gastric erosions were present in 59 of 414 patients (14.25%) in the ≤1-year group and in 293 of 2,510 patients (11.67%) in the >1-year group. The difference between the groups was not statistically significant ($\chi^2 = 2.23$, $p = 0.135$).

As shown in Table 1, no statistically significant differences were observed between the two IHD-duration groups for any of the separately assessed endoscopic characteristics. Antral erosions were identified in 55 patients (13.29%) in the ≤1-year group and 267 patients (10.64%) in the >1-year group ($\chi^2 = 2.54$, $p = 0.111$). Fundal erosions were uncommon, occurring in 3 patients (0.72%) and 15 patients (0.60%), respectively ($\chi^2 = 0.09$, $p = 0.760$). Solitary erosions were recorded in 13 patients (3.14%) in the ≤1-year group and 70 patients (2.79%) in the >1-year group ($\chi^2 = 0.16$, $p = 0.690$), whereas multiple erosions were observed in 46 patients (11.11%) and 219 patients (8.73%), respectively ($\chi^2 = 2.45$, $p = 0.117$). Duodenal bulb erosions were detected in 12 patients (2.90%) in the ≤1-year group and 60 patients (2.39%) in the >1-year group ($\chi^2 = 0.38$, $p = 0.537$) (Table 1).

Table 1. Association between ischemic heart disease duration and erosive gastric and duodenal lesions in 2,924 patients.

Endoscopic finding	IHD ≤1 year (n=414)	IHD >1 year (n=2,510)	Total (n=2,924)	χ^2	P
Gastric erosions, overall	59 (14.25%)	293 (11.67%)	352 (12.04%)	2.23	0.135
Antral erosions	55 (13.29%)	267 (10.64%)	322 (11.01%)	2.54	0.111
Fundal erosions	3 (0.72%)	15 (0.60%)	18 (0.62%)	0.09	0.760
Solitary erosions	13 (3.14%)	70 (2.79%)	83 (2.84%)	0.16	0.690
Multiple erosions	46 (11.11%)	219 (8.73%)	265 (9.06%)	2.45	0.117
Duodenal bulb erosions	12 (2.90%)	60 (2.39%)	72 (2.46%)	0.38	0.537

Note: Among the 352 patients with gastric erosions, data on erosion number were available for 348 patients; data were missing for 4 patients. Data on anatomical localization were available for 340 patients; localization data were missing for 12 patients. Percentages are calculated using the total number of patients in each IHD-duration group as the denominator.

Univariable logistic regression analysis showed no statistically significant association between IHD duration and any of the assessed endoscopic outcomes (Table 2). For overall gastric erosions, the odds of erosions in patients with an IHD duration of >1 year were lower than those in patients with an IHD duration of ≤1 year, but the association was not statistically significant (OR = 0.795; 95% CI, 0.588–1.075; $p = 0.136$). Similarly, no statistically significant associations were observed for antral erosions (OR = 0.777; 95% CI, 0.569–1.060; $p = 0.112$), fundal erosions (OR = 0.824; 95% CI, 0.237–2.858; $p = 0.760$), solitary erosions (OR = 0.885; 95% CI, 0.485–1.615; $p = 0.690$), multiple erosions (OR = 0.765; 95% CI, 0.546–1.071; $p = 0.118$), or duodenal bulb erosions (OR = 0.820; 95% CI, 0.438–1.538; $p = 0.537$).

ORs represent the odds of the respective endoscopic finding in patients with IHD duration >1 year compared with those with IHD duration ≤1 year. An OR <1 indicates lower odds in the >1-year group. None of the associations reached statistical significance (Table 2).

Table 2. Univariable and age- and sex-adjusted logistic regression analysis of the association between IHD duration and erosive lesions.

Endoscopic outcome	Univariable OR	95% CI	P	Adjusted OR*	95% CI
Gastric erosions, overall	0.795	0.588–1.075	0.136	0.780	0.568–1.070
Antral erosions	0.777	0.569–1.060	0.112	—	—
Fundal erosions	0.824	0.237–2.858	0.760	—	—
Solitary erosions	0.885	0.485–1.615	0.690	—	—
Multiple erosions	0.765	0.546–1.071	0.118	—	—
Duodenal bulb erosions	0.820	0.438–1.538	0.537	—	—

*Adjusted ORs for overall gastric erosions were calculated using a logistic regression model adjusted for age and sex. ORs represent the odds of the respective endoscopic finding in patients with IHD duration >1 year compared with those with IHD duration ≤1 year. An OR <1 indicates lower odds in the >1-year group. No association reached statistical significance.

The forest plot showed that the point estimates for all assessed endoscopic outcomes were below 1, while all corresponding 95% CIs crossed 1. Thus, none of the observed associations between IHD duration and erosive gastric or duodenal lesions reached statistical significance. The age- and sex-adjusted analysis of overall gastric erosions yielded a similar result, with no statistically significant association between IHD duration and gastric erosions (Figure 1).

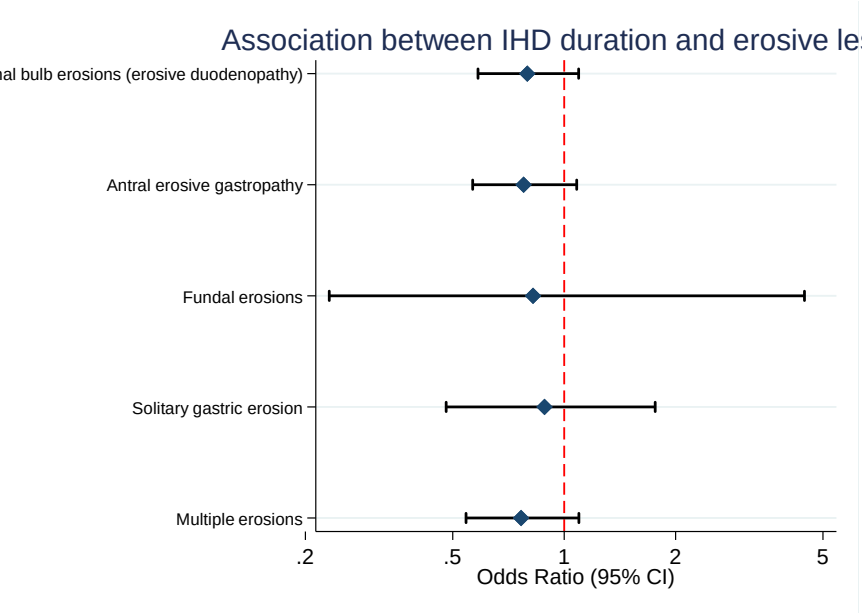


Figure 1. Forest plot depicting the relationship between IHD duration and erosive lesions of the gastrointestinal tract.

Discussion:

In the present retrospective study of 2,924 patients with ischemic heart disease (IHD), no statistically significant association was identified between the duration of IHD and the presence of gastric or duodenal erosive lesions. Although the prevalence of overall gastric erosions was numerically higher among patients with an IHD duration of ≤1 year than among those with a duration of >1 year (14.25% vs. 11.67%), this difference was not statistically significant (p = 0.135).

Similarly, no statistically significant associations were observed for antral, fundal, solitary, multiple, or duodenal bulb erosions.

These findings suggest that the duration of IHD alone may not be a sufficient determinant of erosive lesions of the upper gastrointestinal tract. This is clinically relevant because patients with IHD, particularly those with acute or established coronary disease, frequently require antiplatelet and/or anticoagulant therapy as part of cardiovascular management [1,4]. Contemporary cardiovascular guidelines emphasize the importance of antithrombotic therapy in appropriate patients, while simultaneously recognizing the need to consider bleeding risk and gastrointestinal complications [1].

The absence of a statistically significant association between IHD duration and erosive lesions in our study should not, however, be interpreted as evidence that gastrointestinal risk is clinically unimportant in patients with IHD. Antithrombotic treatment may increase the risk of gastrointestinal bleeding, particularly in patients with pre-existing mucosal lesions or other gastrointestinal risk factors [2,6,8,10,14]. Low-dose aspirin has been associated with an increased risk of gastrointestinal bleeding and other upper gastrointestinal complications, even when used for cardiovascular prevention [3,8]. Therefore, the clinical significance of an endoscopically detected erosion may be greater in a patient receiving antiplatelet or anticoagulant therapy than in a patient without such treatment.

Previous studies have demonstrated the importance of gastrointestinal risk assessment in patients receiving antithrombotic therapy. Aspirin remains an important component of cardiovascular prevention and treatment, but its gastrointestinal effects must be considered when assessing the overall risk–benefit profile of therapy [4]. Evidence also indicates that patients receiving antithrombotic therapy may have an increased risk of upper gastrointestinal complications and bleeding [8,10,14]. Current recommendations therefore emphasize individualized assessment of gastrointestinal and bleeding risk when antithrombotic therapy is prescribed [2,6].

The relationship between gastrointestinal mucosal injury and antithrombotic treatment is particularly important in patients with a previous history of peptic ulcer disease or gastrointestinal bleeding. In patients requiring antiplatelet therapy after ulcer bleeding, the choice of antithrombotic strategy and concomitant gastroprotective treatment may substantially influence the risk of recurrent bleeding [7]. Proton-pump inhibitor therapy is commonly considered in patients with an increased risk of gastrointestinal complications associated with antithrombotic treatment [6,7]. Helicobacter pylori infection is another important modifiable gastrointestinal risk factor, and contemporary consensus recommendations emphasize its diagnosis and eradication in appropriate patients, particularly in those with peptic ulcer disease [5].

Local clinical data also emphasize the relevance of gastrointestinal complications among patients with ischemic heart disease. Daminova et al. reported gastrointestinal bleeding in patients with IHD in a clinical study from Uzbekistan, highlighting the importance of gastrointestinal complications in this patient population [15]. These local observations are consistent with the broader international literature demonstrating that gastrointestinal pathology and bleeding are clinically relevant concerns in patients with cardiovascular disease receiving antithrombotic therapy [2,6,9,10,14]. However, an important distinction should be made between gastrointestinal bleeding and endoscopically detected erosive lesions. The present study evaluated erosive lesions as the principal endoscopic outcome and did not assess gastrointestinal bleeding as the primary endpoint.

In our cohort, patients with an IHD duration of >1 year were significantly older than those with an IHD duration of ≤ 1 year (61.65 ± 8.62 vs. 54.14 ± 9.83 years, respectively; $p < 0.001$). The distribution of sex also differed significantly between the groups. Because age and sex may influence both cardiovascular disease characteristics and gastrointestinal pathology, these variables were considered potential confounders. However, after adjustment for age and sex, IHD duration remained statistically non-significant in relation to overall gastric erosions (adjusted OR = 0.780; 95% CI, 0.568–1.070; p = 0.123). Thus, the observed lack of association was not materially altered by adjustment for these demographic characteristics.

The present results also demonstrate that the absence of an association was consistent across different endoscopic characteristics. The odds ratios for overall gastric erosions, antral erosions, fundal erosions, solitary erosions, multiple erosions, and duodenal bulb erosions were all below 1, suggesting numerically lower odds in patients with an IHD duration of >1 year. However, all corresponding confidence intervals crossed 1, and none of the associations reached statistical significance. These

findings do not support a statistically significant association between IHD duration and the presence of erosive lesions in this study population.

Several explanations may account for the absence of a significant association. First, the development of upper gastrointestinal mucosal lesions is likely multifactorial and may depend more strongly on medication exposure and individual gastrointestinal risk factors than on the duration of IHD itself [2,5,6,8,10,14]. Second, the present study was based on routinely collected retrospective clinical and endoscopic records, and detailed information regarding antiplatelet and anticoagulant therapy, non-steroidal anti-inflammatory drug use, proton-pump inhibitor therapy, Helicobacter pylori infection, previous peptic ulcer disease, and other comorbidities was not sufficiently complete for inclusion in the regression models. These factors may have an important influence on gastrointestinal outcomes and could therefore represent sources of residual confounding.

Third, the study population consisted of patients who underwent endoscopy based on clinical indications during hospitalization rather than all hospitalized patients with IHD. Consequently, selection bias cannot be excluded. Patients referred for endoscopy may have had a different gastrointestinal risk profile from patients who did not undergo the procedure. Therefore, the prevalence estimates observed in this study should not necessarily be generalized to the entire population of patients with IHD.

The timing of endoscopy should also be considered when interpreting the findings. In this clinical setting, patients with indications for endoscopic assessment underwent EGD approximately on the second or third day after hospitalization, primarily to identify erosive and ulcerative lesions of the upper gastrointestinal tract and to assist clinical management, including decisions regarding antiplatelet and anticoagulant therapy. Thus, the present study reflects the endoscopic findings observed during hospitalization rather than the long-term development of gastrointestinal lesions over the course of IHD.

The distinction between erosive lesions and clinically significant gastrointestinal bleeding is particularly important. Endoscopically identified erosions do not necessarily lead to clinically significant bleeding, whereas relatively limited mucosal lesions may become clinically relevant in patients receiving antiplatelet or anticoagulant therapy. Guidelines for the management of gastrointestinal bleeding emphasize the importance of appropriate assessment and management of antithrombotic therapy in patients with gastrointestinal bleeding [2,11–13]. Therefore, the absence of a significant relationship between IHD duration and erosive lesions in our study does not exclude the possibility that IHD-related treatment characteristics may influence the risk of clinically important gastrointestinal bleeding.

The present study has several strengths. First, it included a relatively large cohort of 2,924 patients with IHD. Second, several clinically relevant endoscopic characteristics were assessed separately, including overall gastric erosions, anatomical localization, number of erosions, and duodenal bulb erosions. Third, both categorical comparisons and logistic regression analyses were performed. In addition, an age- and sex-adjusted model was used for the primary outcome of overall gastric erosions, allowing assessment of whether the observed association was influenced by the significant differences in demographic characteristics between the IHD-duration groups.

Nevertheless, the study has important limitations. Its retrospective and cross-sectional design prevents determination of a causal relationship between IHD duration and gastrointestinal mucosal lesions. The study also relied on existing medical and endoscopic documentation, and the completeness and consistency of individual endoscopic descriptors could not be independently verified. Furthermore, the absence of sufficiently complete information regarding antiplatelet and anticoagulant therapy, NSAID exposure, proton-pump inhibitor use, Helicobacter pylori status, previous peptic ulcer disease, and comorbidities limited the ability to control for potentially important confounding factors. Finally, because endoscopy was performed only in patients with clinical indications, selection bias is possible.

Future prospective studies should therefore evaluate the relationship between IHD and upper gastrointestinal lesions while incorporating detailed information on antiplatelet and anticoagulant therapy, gastroprotective treatment, Helicobacter pylori infection, NSAID exposure, previous gastrointestinal disease, and relevant comorbidities. Such studies may help determine whether specific

treatment-related or patient-related factors, rather than the duration of IHD itself, are the principal determinants of erosive gastrointestinal lesions and clinically significant gastrointestinal bleeding.

Overall, the present findings do not support a statistically significant association between IHD duration and erosive gastric or duodenal lesions. The results should be interpreted in the context of established gastrointestinal risks associated with antithrombotic therapy and other patient- and treatment-related factors [1,15]. Further prospective studies incorporating detailed clinical and treatment data are needed to clarify the determinants of gastrointestinal mucosal injury in patients with IHD.

Conclusions

In this retrospective study of 2,924 patients with ischemic heart disease who underwent clinically indicated upper gastrointestinal endoscopy, IHD duration was not significantly associated with gastric or duodenal erosive lesions. Although gastric erosions were numerically more frequent in patients with an IHD duration of $\leq$1 year than in those with a duration of $>$1 year (14.25% vs. 11.67%), this difference was not statistically significant ($p = 0.135$). No significant associations were observed for the number or anatomical localization of erosions, including antral, fundal, solitary, multiple, and duodenal bulb erosions. The association between IHD duration and overall gastric erosions remained non-significant after adjustment for age and sex. Given the retrospective design and incomplete information on several potentially important gastrointestinal and treatment-related factors, these findings should be interpreted cautiously and confirmed in prospective studies.

Authors' contribution

Sh.S. Kodirov: study conception and design, data analysis, interpretation of results, and manuscript preparation. L.T. Daminova: study conception, clinical supervision, interpretation of findings, and critical revision of the manuscript. Both authors reviewed and approved the final version of the manuscript.

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Ethics approval

The study was conducted in accordance with the Declaration of Helsinki (2013 revision) and approved by the Ethics Committee of the Republican Specialized Scientific and Practical Medical Center of Cardiology (RSSPMC of Cardiology), Tashkent, Uzbekistan (Protocol No. 11, June 22, 2026).

Consent for publication.

The requirement for written informed consent was waived by the Ethics Committee because the study used anonymized retrospective clinical and endoscopic data obtained during routine medical practice and involved no additional interventions.

Data Availability Statement

The data analyzed in this study are not publicly available because they are derived from retrospective clinical records and are subject to institutional data-protection requirements. Data may be available from the corresponding author upon reasonable request and with permission of the responsible institution.

Acknowledgments

None.

Conflict of interest

The authors declare no conflicts of interest.

Abbreviations

IHD	Ischemic heart disease
EGD	Esophagogastroduodenoscopy
OR	Odds ratio
CI	Confidence interval
SD	Standard deviation
STROBE	Strengthening the Reporting of Observational Studies in Epidemiology
NSAID	Non-steroidal anti-inflammatory drug
RSSPMC	Republican Specialized Scientific and Practical Medical Center

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