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Risk Factors for Prevention Stroke (IS or TIA) Due to Cerebral Infarction in Young Adults: A Meta-Analytical Study

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Abstract

Ischemic strokes (IS), also referred to as cerebral ischemia or brain ischemia, is a significant cause to the brain cells damage or death. Approximately, 10% - 14% of ischemic strokes cases occurred in young adults. Hence, we conducted a meta-analysis to find the effective interventions to prevent the best strokes caused by cerebral infarction in young adults. The search was done in different databases, including Google scholar, PubMed, Embase, Medline, Cochrane Central Register of Controlled Trials, Cochrane Database, Scopus, and Web of Science from January 2016 to April 2020, and only English published articles were considered. Our analysis included studies that stratified the risk of ischemic stroke by CHA2DS2-VASc score for patients with nonvalvular atrial fibrillation. Further, random effects model was used to estimate the summary annual rate of IS. Pooled relative risks and odds ratios, with their 95% confidence intervals, were calculated, respectively. The analysis was conducted using STATA (version 12), pooled effect sizes were calculated using the random-effects model and heterogeneity was tested for using the I^2 statistic. The analysis included 13 studies. The analysis shows that diabetes, high blood pressure, ischemic heart disease, atrial fibrillation, hypercholesterolemia, alcohol consumption and smoking are significant risk factors. In Caucasian and Chinese ischemic stroke patients, the risk factor associations associated with ischemic stroke subtypes are similar. Compared to all other ischemia subtypes, diabetes is more familiar with aortic stroke, atrial fibrillation, ischemic heart disease (with obstruction), hypertension and diabetes. Our research shows that atrial fibrillation, ischemic heart disease, and hypercholesterolemia are low in patients with ischemic stroke and the risk factors are higher. Further analysis of each patient's data is required to enable confounders' adjustments to confirm and expand these findings.

Keywords

Young Adults, Stroke, Cerebral Infarction, Risk-Factors, Prevention

1. Introduction

Background

Ischemic stroke (IS) in young people is far less common than in the elderly, but the potential pathogens and risk factors are more diverse with leading causes of death. Approximately, the prevalence of IS from 10% to 15% of all strokes occurs among adults age range 18 to 50 years [1]. The fact is that stroke mimics remain a heterogeneous entity in diagnosis may cause a challenge and difficulty to identify it in young adults.

The latest research revealed the increasing of IS cases among young people in United States and Europe. Increasing of prevalence among younger adults has been documented with an increase in traditional stroke risk factors such as hypertension, dyslipidemia, diabetes mellitus, tobacco use, and obesity which are typically common among older adult's people [2]. On the other hand, young adults were also reported suffering from acute stroke, combined with an increasing of the traditional cardiovascular disease. There is controversy about whether or to what extent these conventional risk factors cause stroke [3] [4], especially for people younger than 40 years old. Evidence shows that stroke is one of leading causes of death among Chinese population, and accounts for about 0.33 of the global death [5]. In addition, the crude death (CDR) in China was sharply increased over the past three decades compared with other countries [6].

Further study published by Strong *et al.* (2007) reported that 5.7 million deaths due to stroke in year 2005, and 87% of these deaths were reported in low-income and middle-income countries [7], thus becoming a global health issue with the increase of the prevalence due to the ageing population, and with the increase of the cases of morbidity and mortality rate [8]. In 2015, China had 15.2 per cent of the population over 60 years of age, and this proportion is expected to rise to 36.5 per cent by 2050 [9]. The evidence shows that among younger stroke patients, there are some risk factors that are either unique to women or more common among women. This includes the use of contraceptive methods that contain estrogenic, pregnancy and migraine auras. Compared to men, migraines and migraines with aura are more common in young women and are more likely to have a stroke while smoking and taking combine oral contraceptives [10]. In addition, a recent previous meta-analysis examined the risk of IS focused on improving risk stratification of ischemic stroke among patients with atrial fibrillation and did not access the possible risk factors for prevention stroke (IS or TIA) due to cerebral infarction in young adults patient. We thus conducted a meta-analysis of all available studies from 2016 to April 2020 to find the effective interventions to prevent the best strokes caused by cerebral infarction in young adults. Furthermore, possible moderators such as patients' baseline characteristics and demographic factors including others risk factors associated with adverse IS outcomes were evaluated.

2. Methodology

2.1. Eligibility Criteria

We included studies that stratified the risk and all articles published in English were assessed in-depth. Overall all titles and abstracts were screened for our inclusion criteria throughout using the Mesh terms (RCT, prospective, placebo controlled study, double-blind, ICAP (double-blind trial, multi-centre), CORP and double-blind, multi-centre, randomized controlled trial pre-documented modern risk factors and stroke prevention (IS and TIA) Cerebral infarction in young people were identifying as inclusion criteria. We also include studies provided scientific reports on risk factors of stroke such as (diabetes, high blood pressure, ischemic heart disease, atrial fibrillation, hypercholesterolemia, alcohol consumption and smoking). We excluded studies that did not meet our criteria such as study that primary data were not available/analyzed (e.g., reviews, editorials, or letters to the editor) or study with lack of standards design, or confusing for the researcher to understand. A total of 2500 studies were reviewed, 100 are screened, 20 full text articles are eligible, and, 13 studies were included in the analysis (Figure 1).

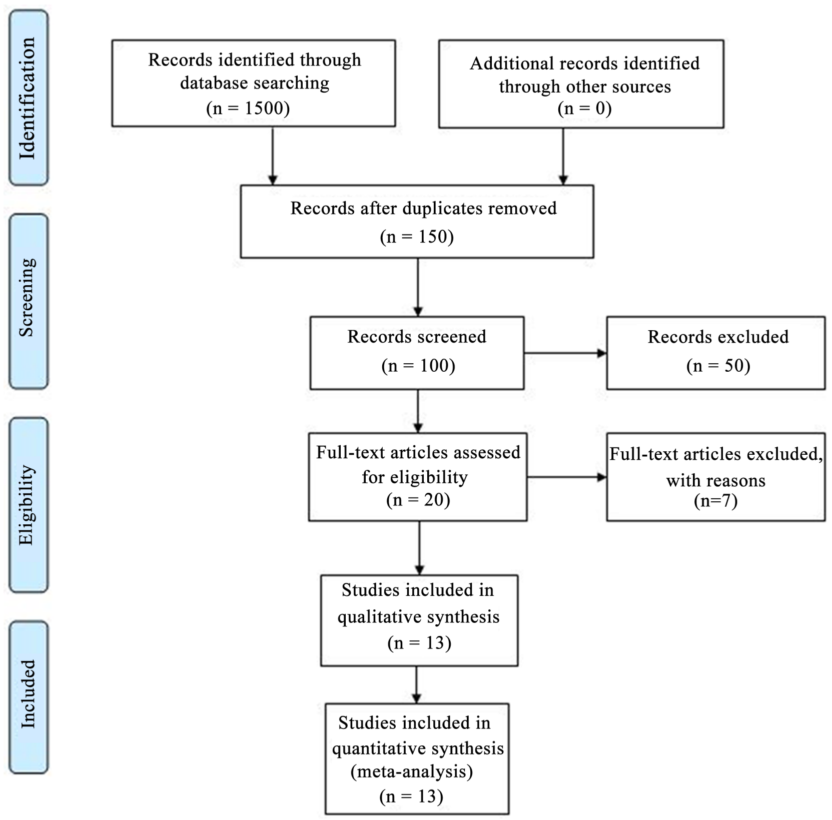

Figure 1. PRISMA flow chart: Search strategy preferred reported items.

2.2. Data Sources

For the purpose of the study, the potential published studies were retrieved based on a literature search of English language articles from 1st January 2016 to April 2020 using Google scholar, PubMed, Embase, Medline, Cochrane Central Register of Controlled Trials, Cochrane Database, Scopus data, and Web of Science using the using keywords "stroke," "cerebral infarction," "risk factors," "prevention", and "young adults,". We also identified pertinent studies through references of the retrieved articles and contacted concerned authors where necessary. Additional relevant publications were identified by a manual search of bibliographies of retrieved studies published above mentioned databases.

2.3. Study Selection

We developed standardised data collection. Forms before data collection. Two investigators were extracted data from the overall eligible studies. Then, other co-authors collectively reviewed the extracted data and double check. Finally, all the controlled, randomised trials were included. These (RCT) trials were based on studies in scholarly English medical papers. The selected study followed the recommended guidelines for meta-analysis [11]. The potential published studies were retrieved based on inclusion and exclusion criteria of the study. The overall studies included in the meta-analysis are shown in **Table 1**.

2.4. Data Quality and Extraction

Publishing particulars, integration/outcome measures, demographic trends and cardiac risk ratio of patients registered, interpretation of the intervention strategies was using. Variations of the result and incidents were retrieved and procured. Discussions with the third spectator rectified petty arguments, and then after the discussion, a compromise was managed to reach. Publication bias in RCTs (such as person involved dimness, premature stoppage of the trial for effectiveness before completing scheduled enrollees, and loss to follow-up) was also analysed. The recognised records seemed to be n = 1500 via electronic databases. Documentation, consequently recognised from many other references, was n = 0. After returned demolition, documents would be included n = 150, and the record was then evaluated on the considerations for segregation and integration. The full-text articles were evaluated as per the eligibility requirements, and that was n = 20. The total number of eight studies (n = 13) was deemed (**Figure 1**).

2.5. Data Analysis

The primary data for enrolled studies and number of patients in RCTs and other factors were such as stroke, e.g., Ischemic stroke and Transient Ischemic Attack risk factors and prevention outcome were analysed. All statistical data were analysed using RevMan 5.3 Models of random effects that embed heterogeneity among trials and give broader centrist intervals of confidence (CI) (when heterogeneity prevalent has also been used for all assessments) were discussed. I^2

Table 1. Characteristics of the studies included in the meta-analysis.

Author Name, Year	Study Design	Region	Sample size	Study Period	Young Adults Age range (Years)	Diagnosis	References
Rutten-Jacobs *et al.*	FUTURE (Follow-up of transient ischemic attack and stroke patients and unelucidated risk factor evaluation)	Netherland	959	1980-2010	18 - 50	IS, TIA	[12]
Diaz-Guzman *et al.*	Spanish IBERICTUS study	Spain	256	2006	17 - 54	IS, TIA	[13]
Putaala *et al.*	Cohort	Europe	3944	2010	15 - 49	IS	[14]
Putaala *et al.*	Cohort	Finland	1008	2007	15 - 49	IS	[15]
Toni *et al.*	SITS-ISTR (safe implementation of thrombolysis in stroke-international stroke thrombolysis register)	International	26,671	2012	18 - 50	IS	[16]
Ji *et al.*	Get with the guidelines-stroke (database at Mass General hospital)	Boston, USA	2643	2013	15 - 45	IS, TIA	[17]
Greisenegger *et al.*	Vienna Stroke Registry	Australia	661	2001	18 < 50	IS, TIA	[18]
Kissela *et al.*	Greater Cincinnati/Northern Kentucky Stroke study (GCNKSS)	USA	1942, 2034, 1916	2005	20 - 54	IS	[19]
von Sarnowski *et al.*	Stroke in Young Fabry Patients cohort	Europe	4467	2010	18 - 55	IS, TIA	[20]
Emer R. McGrath *et al.*	Cohort	Canada	3197	2012	20 - 77	IS	[21]
Reetta Kivioja *et al.*	Case-Control Study	Finland	961	2018	25 - 49	IS	[22]
Chirantan Banerjee *et al.*	Prospective	New York	3298	2012	18 - 66	IS	[23]

statistics determined statistical heterogeneity (I^2 = 25% - 49%), moderate and high. Relative risks (RR) have been used to pool results with a meaning level of 5.0 per cent on two sides. With CIs of 95 per cent, individual trials and description outcomes were also confirmed.

3. Results and Analysis

3.1. A Systematic Review Included Study

Of the 1500 publications meeting initial search criteria, 20 articles were eligible and 13 detailed articles were finally evaluated and included in the analysis. The meta-analysis considered the ten studies in which FUTURE, RCTs, Cohort, IBERICTUS study, Retrospective, and Prospective were involved. The features of the research findings and factors associated with our meta-analysis were summarized in Table 1. The study retrieval and selection strategy are illustrated in Figure 1.

3.2. Baseline Patient's Characteristics

The participant benchmark attributes have designed to measure the stroke (IS and TIA) in young adults are summarized in Table 2. The studies' considered

Table 2. Baseline patient's characteristics in ischemic stroke.

Variables	Baseline Characteristics of Patients with Ischemic Stroke in Young Adults due to Cerebral Infarction					
	Included Studies					
	Andrew B. Mitchell *et al.*, 2015	Rutten-Jacobs LC *et al.*, 2013	Ji *et al.*, 2013	Toni *et al.*, 2012	Emer R. McGrath *et al.*, 2012	Chirantan Banerjee *et al.*, 2012
Age (yrs), mean ± SD	40.8 ± 7.1	40.3 ± 7.8	37.5 ± 7	-	79.21 ± 9.81	69 ± 10
Male, %	52.0	47.4	38.7	-	56.3	37.2
Hypertension, %	42.3	28.1	26	27.1	73.3	-
Diabetes %	16.9	6.6	15	5.8	24.2	36.8
Current Smoker %	44.8	57.3	37	42.7	-	17.3
BMI (kg/m^2) mean ± SD	29.7 ± 7.6	-	-	-	-	-
Excess Alcohol Consumption %	-	7.6	1	-	7.1	32.6

young adults with stroke, and in the previously announced studies. There were studies published of IS and TIA are recorded in Table 2 given the following. Obesity rates in the United States have been gradually rising for many decades. Obesity was prevalent in 16.9% of youth and 34.9 per cent of adults in the United States in 2011-2012. Obesity is a well-known risk factor for stroke among senior citizens. There is evidence that as young adults' obesity levels rise, their ischemic hospitalisation rates rise as well [2]. Only a few studies have looked into the connection between obesity and early-onset stroke. Characteristics of studies have discussed. According to the survey, it most frequently occurs in 40 - 69 years of age as with the highest mean and standard value 79.21 ± 9.81. Other details have discussed below.

3.3. Analysis of Risk Factors for Stroke (IS and TIA) Due to Cerebral Infarction in Young Adults

Young people now account for nearly half of the worldwide burden of stroke since they can persist stroke for a prolonged period, and stroke happens in countries with poor socio-economic status at a young age [24]. The risk factors, including hypertension, obesity, atrial fibrillation (AF), ischemic stroke (IHD), hyperlipidemia, alcoholism, and cigarette smoking, were investigated. In stroke patients, the prevalence of hypertension is comparable (the combined ratio is 59%); more details have given in Figure 2.

According to research, the outcomes of ischemic stroke and TIA in young adults were remarkably similar, with insignificant heterogeneity for either risk factor (Figure 3(a)). Diabetes was marginally (ORs 1.34 and 1.42) more

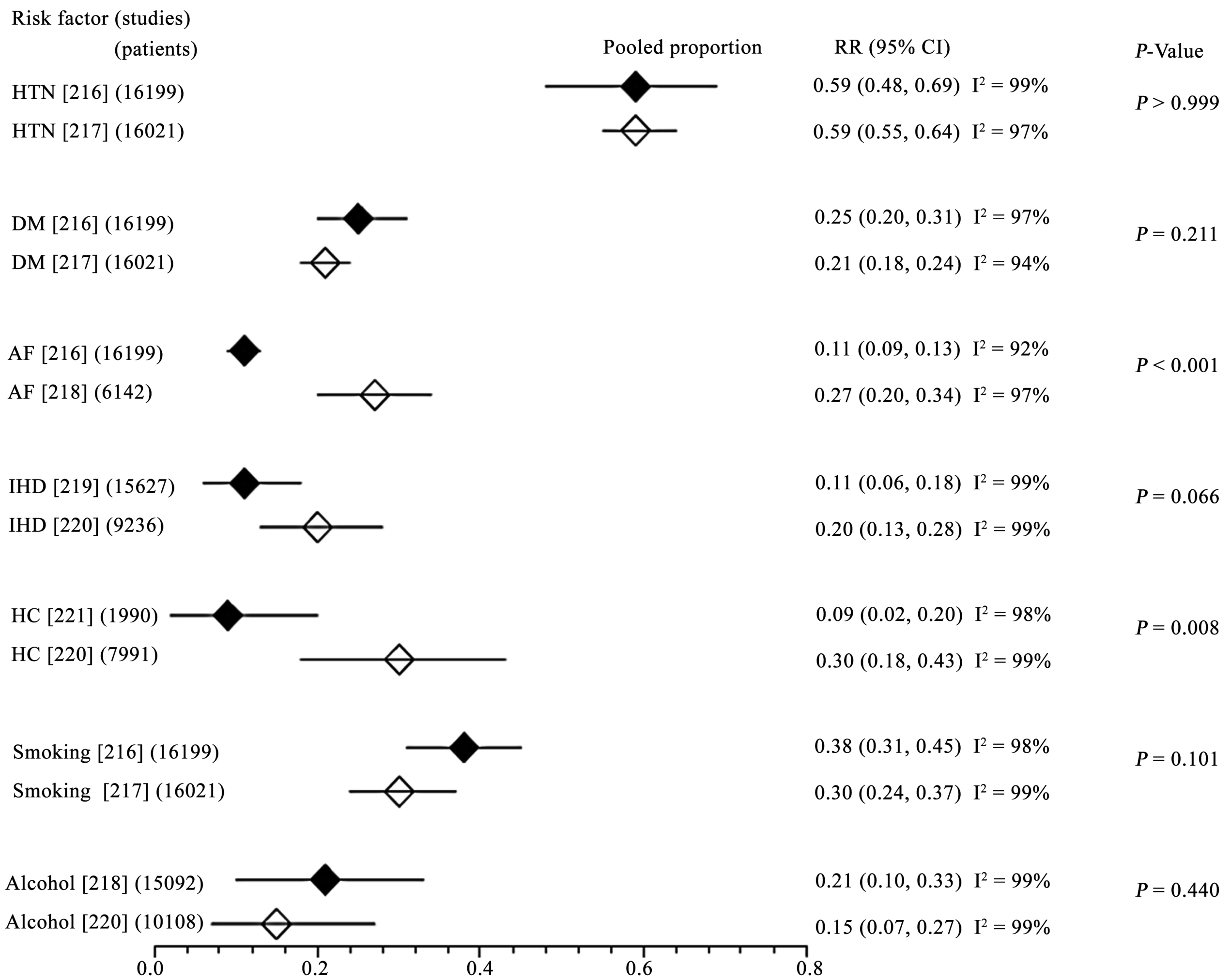

Figure 2. Meta-analysis of the prevalence of risk factors in young patients with ischemic stroke/TIA. CI = confidence interval; I = discordance; HTN = hypertension; DM = diabetes; AF = atrial fibrillation; IHD = ischemic heart disease; HC = hypercholesterolemia. The horizontal line represents 95% CI and Percentage of diamonds in total.

common, whereas AF was significantly (ORs 0.27 and 0.19) less common. A meta-analysis of the research from the perspective of China has also conducted. The findings of the study are not always related to race. Compared with white people, Chinese are more likely to drink in IS, but there is no gap between cultural minorities (Figure 3(a)). When comparing IS and TIA strokes, there seems to be an important and powerful positive correlation between atrial fibrillation (the Chinese and white ORs are 71.36 and 36.81, respectively) and IHD (ORs are 3.62 and 1.31). Both were substantially higher in Chinese citizens (Chinese-Caucasian heterogeneity in AF: $P = 0.001$, IHD: $P = 0.021$; Figure 3(b)). The CE population and other subtypes have lower rates of hypertension, diabetes, smoking, and drinking. However, the findings of hypertension and diabetes in China, as well as smoking and drinking in Caucasians, are individually important (heterogeneity between hypertension) gender: $P = 0.166$, diabetes: $P = 0.079$, smoking: $P = 0.011$, alcohol: $P = 0.028$; Figure 3(b)).

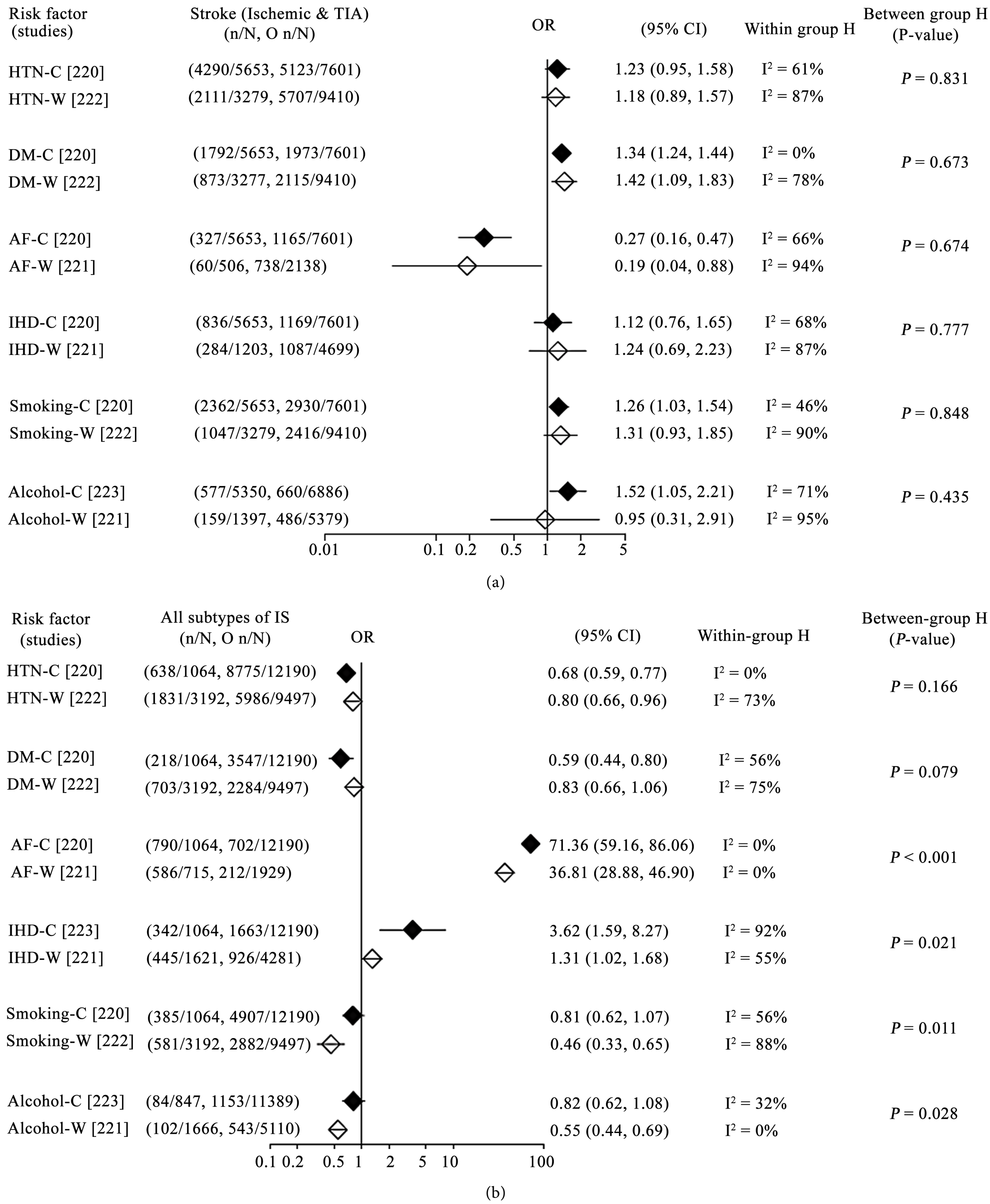

Figure 3. A meta-analysis compares the risk factors (ischemia and TIA) of stroke among young Chinese and Caucasians. (a) The figure shows the odds ratio of the Chinese and Caucasian research on ischemic stroke and TIA risk factors. (b) Shows the risk factors for all subtypes of ischemic stroke. n = number of patients with risk factors; N = total number of patients; OR = odds of winning; CI = confidence interval; H = heterogeneity; I = inconsistency; HTN = hypertension; DM = diabetes; IHD = ischemic heart disease; C = Chinese; W = Caucasian (white); the horizontal line represents 95% CI. The diamond represents the combined operations.

3.4. Analysis of Prevention for Stroke (IS and TIA) Due to Cerebral Infarction in Young Adults

In the current study, RevMan has analysed the prevention of stroke. According to the results of some studies have carried out (Nigel S. Beckett *et al.*, 2008; SHEP Cooperative Research Group, 1991; Lin H *et al.*, 2013; Wang CJ *et al.*, 2016; Zhao J *et al.*, 2015; Yan Y, Zhang X., 2016; and SHEP Cooperative Research Group, 1991) were considered for meta-analysis [22] [23] [25] [26] [27] [28]. More details have discussed in **Figure 4**.

4. Discussion

This meta-analysis aimed at quantifying the risk factors (ischemia and TIA) of stroke, where the findings show an increased BMI is associated with stroke onset, consistent with the study conducted by Meschia JF (2014) in the elderly [29]. After adjusting for hypertension and diabetes, the association between BMI and stroke weakened and was no longer statistically significant. Although the incidence and aetiology of different countries, genders and ethnicities are very different, ischemic stroke in young people can affect people of all races and races. These differences cannot be explained only by the differences in resource-dependent diagnosis and treatment. Comprehending the aetiology of ischemic stroke amongst young adults in numerous countries is crucial for designing regionally effective intervention and prevention strategy to minimise the worldwide stroke risk.

Never the less the findings of the study confirm the incidence of diabetes is slightly higher but much more pronounced (OR 1.34), while AF is significantly less (OR 0.27). Stroke has long associated with hypertension, IHD, and smoking (OR 1.12). Comparing IS and TIA strokes, there is a significant and robust positive correlation between AF and IHD. All are considerably higher in China, while obesity, hypertension, cigarettes, and alcoholism are pretty prevalent in the European population than in other people. The effects of drinking alcohol on

Study or Subgroup	Preventative Measures Events	Total	Control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Lin H et al., 2013	17	200	22	200	13.5%	0.75 [0.39, 1.46]
Nigel S. Beckett et al., 2008	1241	1933	1245	1912	17.3%	0.96 [0.84, 1.10]
SHEP Cooperative Research Group 1991	32	781	61	794	15.5%	0.51 [0.33, 0.80]
SHEP Cooperative Research Group 1991	12	2365	12	2371	12.2%	1.00 [0.45, 2.24]
Wang CJ et al., 2016	73	3868	183	3868	16.6%	0.39 [0.29, 0.51]
Yan Y, Zhang X., 2016	7	232	13	232	11.0%	0.52 [0.21, 1.34]
Zhao J et al., 2015	53	510	13	510	13.9%	4.43 [2.39, 8.24]
Total (95% CI)		9889		9887	100%	0.84 [0.51, 1.41]
Total events	1435		1549			

Heterogeneity: Tau² = 0.39; Chi² = 68.07, df = 6 (P < 0.00001); I² = 91%

Test for overall effect: Z = 0.65 (*P* = 0.52)

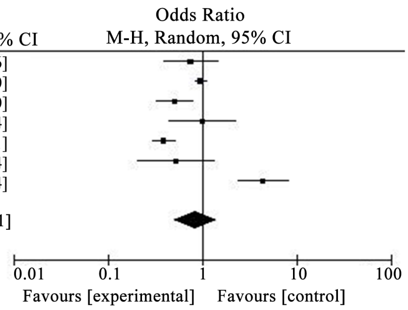

Figure 4. Forest plot of a randomised controlled trial (RCT) of young adults (ischemic stroke and TIA) prevention. The individual and combined odds ratio (OR) of RCT has a 95% confidence interval (CI). Using the variance component model, the CI OR of 95% of the combination has calculated. The weights determine the impact of each report on the general calculation of drug effects. Each square and a horizontal line represent the point estimate, and the RR for each trial is 95% CI. The diamond is the combined OR; the estimated point is the middle of the diamond, and the 95% CI is the size. Data from RCT showed an OR of 0.84. 95% CI 0.51 - 1.41, $P = 0.52$; $I^2 = 91\%$ of all adverse effects.

diabetes complications in China and Caucasians are collectively significant (heterogeneity among hypertensive populations). In the current study, In China IS patients, the frequency of AF, IHD, and hyperlipidemia was reduced than in white counterparts and consistent with other reports. Compared with white patients, these risk factors have a higher prevalence in the Chinese population. Because of our meta-analysis, more than 80% of Chinese IS patients have recruited after 2015. The majority has tripled. Previous studies [30] [31] [32] have given substantial and related interactions in the minority cultural point regarding risk factor associations between ischemic subtypes. Surprisingly, our findings indicate a stronger association between AF and IHD than between IS and TIA.

Patients with diseases of the large arteries or blood vessels are more likely to have dyslipidemia, while stroke caused by cardiac obstruction is less likely to have dyslipidemia. Young dyslipidaemia was not associated with an increased stroke incidence from all causes (PAR −2.1%; 95% CI −6.7 to 2.6, OR = 0.9; 95% CI 0.8 to 1.1). Many other stroke triggers in young adults can also cause this, and dyslipidemia is not always variable.

According to the Fabry Youth Stroke Report (SIFAP), high blood pressure is the most important risk factor for stroke. The PAR is 25.5 per cent (95 percent CI 22.1 to 28.2) and has been associated with stroke in young adults (or: 2.3; 95 per cent). CI 2.0 to 2.6) [20]. Although not a minor stroke, Africa has the highest prevalence of hypertension (46%), while countries in Latin America have the lowest rate (35%) [33].

The risk of a stroke due to smoking increases in young people (PAR by 19.9%, 95% CI from 14.8 to 23.9, odds ratio 1.78, 95% CI from 1.50 to 2.11) [34]. Obesity and inactivity are two configurable risk factors that can contribute to vascular disease. Obesity is characterised by a BMI of 30 or higher and occurs in more than 10% of young people with stroke [32]. Both developed and developing countries considered obesity as a problem in the middle of the year [35]. Patients with high blood pressure are more likely to have a stroke, which can be reduced by controlling blood pressure. The deposit insurance rate of 30% to 40% is associated with blood pressure management following a TIA. The lower your blood pressure, the less likely you are to have a stroke. Reducing sodium intake in the diet and losing weight are significant lifestyle improvements associated with lowering blood pressure. Altered blood pressure values in hypertensive patients could indicate cerebral ischemia and the effects of anti-hypertensive drugs. High systolic blood pressure and maximum variation in systolic blood pressure from a visit to visit were essential predictors of secondary stroke in a group of TIA patients (risk ratios were 6.22 and 15.01, respectively) [20].

Smoking and cerebral ischemia have a dose-response relationship, with heavier smokers being at higher risk. Behaviour therapy is the most effective way to stop smoking. Using a combination of NRT and social support increases your chances of quitting by 50 to 70 per cent [36].

According to studies, the risk of having a stroke within 90 days after a TIA is 10% to 20%, with half of the stroke occurring [37]. Treatment, including drug therapy and surgery, should begin as soon as possible after a TIA to reduce the risk of stroke. This could mean that patients at high risk would benefit from hospitalisation. The possibility of comprehensive medical testing, diagnosis, and early care to reduce stroke risk is one of the benefits of inclusion. If a patient has a stroke in the hospital, the use of TPA could be improved. It should be used on any patient with lesions on an MRI scan. TIA and TIA control can help reduce the risk of a later stroke. In the first evaluation, 50 to 80 per cent of patients with a TIA or moderate stroke had high blood pressure [38]. According to the TIA, patients with systolic blood pressure greater than 140 mm Hg or diastolic blood pressure greater than 90 mm Hg have a higher risk of stroke (odds ratio = 2.1, 1.9, and 1.6 at days 2, 7, and 90, respectively). Comorbidities, age and risk of hypotension should be considered when lowering blood pressure [39].

Antiplatelet drugs have been prescribed to patients with non-thromboembolic cardiac TIA or a stroke history to prevent further stroke. According to AHA/ASA guidelines, aspirin and dipyridamole/aspirin (Aggrenox), and clopidogrel (Plavix) are appropriate guidelines for first-line AHA/ASA medications. Aspirin is the most widely used platelet aggregation inhibitor and has been shown to reduce stroke risk in humans [40]. The European Stroke Prevention Study 2 compared the stroke prevention effects of aspirin and dipyridamole (Persantine) and their combinations. The incidence of moderate wind was 18% after patients with a TIA history or stroke received aspirin therapy, and the resulting TIA was 22%. The optimal dose of aspirin for efficacy and protection is 81 milligrams per day [40]. Various reports indicate that adding dipyridamole extended-release to aspirin can reduce the frequency of ischemic brain events, including the European Stroke Prevention Study 2. The actual risk is reduced by 5.9% (number of treatments = 17) compared to placebo. Compared to aspirin alone, the ESPRIT (European/Australian Reverse Stroke Prevention Trial) study with dipyridamole/aspirin showed that the absolute risk of stroke was reduced by another 1% per year [41]. According to the META analysis, the average requirement for dipyridamole/aspirin was 23% compared to aspirin and 37% compared to placebo.

In the PRoFESS non-inferiority study (the prevention program to successfully prevent the second stroke), clopidogrel was compared with presentation/aspirin in subjects diagnosed with stroke [42]. Clopidogrel was compared with aspirin with clopidogrel alone in the MATCH study (clopidogrel treatment for arterial thrombosis in high-risk patients) to prevent stroke after a transient ischemic attack or previous stroke. This combination increased the risk of bleeding and reduced the risk of statistically significant vascular events. Because anticonvulsant agents are used to preventing stroke after a TIA is similar, drugs should be selected based on the risk and clinical condition of the patient, cost factors, and side effects. Due to bleeding risk, taking clopidogrel with aspirin is not recommended to avoid stroke unless there are other indications for treatment [43].

According to the AHA/ASA, patients with chronic coronary artery disease and hypertensive patients at high risk of developing cardiovascular disease should take a statin to avoid stroke, regardless of their initial LDL-C levels, according to the AHA/ASA. Prescription statins for patients who have previously had a TIA or stroke but were not suspected of having coronary artery disease and who have LDL-C levels greater than 100 mg/dL (2.59 mmol/L). The LDL-C level must be reduced by at least 50%, or the target value must be less than 70 mg/dL (1.81 mmol/L) [44]. Statin treatment reduces the overall risk of a five-year stroke in patients with a TIA or history of stroke by 2.2 per cent (response ratio to 16 per cent; the number of treatments required = 45). Compared with ischemic stroke, LDL-C levels are reduced by 50% or more, LDL-C levels are increased by 33%, and significant coronary events are reduced by 37%. [44] Statin therapy reduces the risk of clinically significant CHD for five years from 8.6% to 5.1% in patients with a history of TIA or stroke who are not known to have CHD (overall risk limit = 3.5%); (people treated = 29) [45]. Patients with a TIA or stroke are said to have an asymptomatic disease. The EVA-3S test (endarterectomy and angioplasty in patients with severe carotid stenosis) found a 3.9 per cent chance of signs or symptoms by day 30 of stroke or death. The incidence of complications after surgery was 9.6%. After six months, the risk of stroke or death due to carotid endarterectomy was 6.1%, and stroke or death due to carotid endarterectomy was 11.7% [46]. The risk of stroke or death for four years after carotid endarterectomy was 4.7%, and the risk for four years after fixation of the carotid artery stencil was 6.4%. However, myocardial infarction is more common after carotid endarterectomy [47]. If the incidence of stenosis is less than 50%, then no intervention is required. In some cases, carotid tentacle may be considered (e.g., if entry into the restricted area during surgery is complicated, and the risk of complications from endovascular interventions is low) [48]. The current study included metadata of a number of stroke prevention reports. Our results show that anti-hypertensive drugs, statins, exercise and smoking cessation are the most important preventative measures to prevent stroke. Our analysis has some major strengths. First, we will perform a thorough search to find any relevant search published in English. Second, we only included studies that used widely accepted stroke concepts, classified approaches, risks, and preventive measures. Third, we carefully recorded the characteristics, processes, and concepts of the risk factors used in each specific analysis. There are some limitations. According to a systematic search in the literature, only a few studies meet the requirements for inclusion. Clinic-based studies have only found that the ideal research population is community-based and covers all stroke patients in a specific setting. Second, we do not have patient personal data corrected for potential confusing variables (such as age) and socio-economic and educational data that could be used for interpretation, as our research focused on publicly available data.

5. Conclusion

Because of the rising incidence and long-term effects of stroke among young adults, all developed and developing countries will face severe public health concerns. Geographical, racial, and sex variations and susceptibility to vascular complications all contribute to the significant disparities in the prevalence of ischemic stroke between young adults seen worldwide. With the increase in risk factors worldwide, ideally, in all income types of countries, the focus should be on primary and secondary prevention from the beginning. Attention should pay to the risk factors for specific continents and specific countries. The conclusion is that given that stroke is a frequent and severe disease, stroke prevention is a vital issue, and effective acute stroke therapy at the individual level has limited public health impact. Vascular risk factors such as high blood pressure, hyperlipidemia, and smoking should address from stroke prevention. The best treatment of stroke risk factors for all stroke and TIA cases and antithrombotic therapy and carotid artery surgery for patients with severe ischemic stroke or TIA are the supplementary strategies for reducing the risk of any new incidents following the first ischemic stroke or TIA.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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