SAFETY OF INTRAVENOUS THROMBOLYSIS IN AN ACUTE ISCHEMIC STROKE PATIENT WITH SEVERE HEMOPTYSIS DUE TO UNDERLYING BRONCHIECTASIS

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Abstract

Introduction: Despite that bronchiectasis has been mentioned in patients with even fatal complications of intravenous thrombolysis (IVT) for myocardial infarction, the safety of IVT administration in patients with known bronchiectasis and acute ischemic stroke (AIS) is not established.

Methods: We present the case of a 74-year-old woman who received intravenous thrombolysis for AIS despite recent hemoptysis due to underlying bronchiectasis.

Results: A 74-year-old patient with recent (8 hours) hemoptysis due to extensive underlying bronchiectasis presented with acute left hemiplegia, dysarthria, gaze deviation and decreased level of consciousness (NIHSS-Score on admission: 22) within 75 min from symptom onset. She was treated successfully with IVT, resulting in substantial neurological improvement. (Discharge-NIHSS: 2). Neuroimaging studies disclosed infarctions in different arterial territories, without hemorrhagic complications, while cardiac monitoring revealed paroxysmal atrial fibrillation (AF) as the underlying stroke etiology.

Discussion: The present case highlights that systemic thrombolysis for AIS despite recent hemoptysis due to underlying bronchiectasis appears to be safe.

Key words: hemoptysis, bronchiectasis, brain MRI, acute ischemic stroke, intravenous thrombolysis

ΑΣΦΑΛΕΙΑ ΤΗΣ ΕΝΔΟΦΛΕΒΙΑΣ ΘΡΟΜΒΟΛΥΣΗΣ ΣΕ ΑΣΘΕΝΗ ΜΕ ΟΞΥ ΙΣΧΑΙΜΙΚΟ ΑΓΓΕΙΑΚΟ ΕΓΚΕΦΑΛΙΚΟ ΕΠΕΙΣΟΔΙΟ ΚΑΙ ΠΡΟΣΦΑΤΗ ΣΟΒΑΡΗ ΑΙΜΟΠΤΥΣΗ ΛΟΓΩ ΥΠΟΚΕΙΜΕΝΩΝ ΒΡΟΓΧΕΚΤΑΣΙΩΝ

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Περίληψη

Εισαγωγή: Σε υπάρχουσες βιβλιογραφικές αναφορές, οι βρογχεκτασίες του πνευμονικού παρεγχύματος έχουν συνδεθεί με θανατηφόρες επιπλοκές σε ασθενείς που έλαβαν ενδοφλέβια θρομβόλυση λόγω εμφράγματος του μυοκαρδίου. Η ασφάλεια όμως της ενδοφλέβιας θρομβόλυσης σε ασθενείς με οξύ ισχαιμικό αγγειακό εγκεφαλικό επεισόδιο (ΑΕΕ) και προϋπάρχουσα βρογχεκτασία μένει να διερευνηθεί.

Μέθοδοι: Στην παρούσα μελέτη παρουσιάζουμε ένα περιστατικό, που αφορά γυναίκα 74 χρονών, η οποία έλαβε ενδοβλέβια θρομβόλυση λόγω οξέος ισχαιμικού ΑΕΕ παρά την αναφερόμενη πρόσφατη αιμόπτυση σε έδαφος γνωστών βρογχεκτασιών.

Αποτελέσματα: Ασθενής 74 ετών με αναφερόμενη αιμόπτυση προ 8ώρου σε έδαφος γνωστών εκτεταμένων βρογχεκτασιών, προσήλθε στο τμήμα επειγόντων περιστατικών μετά από οξεία εγκατάσταση αριστερής ημιπληγίας, δυσαρθρίας, στροφής βλέμματος προς τα δεξιά και μειωμένου επιπέδου επικοινωνίας

(NIHSS-Score-εισόδου:22), εντός 75 λεπτών από την έναρξη των συμπτωμάτων. Η ασθενής έλαβε επιτυχώς ενδοφλέβια θρομβόλυση, οδηγώντας σε σαφή βελτίωση της νευρολογικής της συμπτωματολογίας (NIHSS-Score-εξιτηρίου:2). Τα απεικονιστικά ευρήματα αποκάλυψαν πολλαπλά έμφρακτα σε διαφορετικές αρτηριακές κατανομές, χωρίς αιμορραγική μετατροπή. Ο καρδιολογικός έλεγχος με 24ώρο monitoring του καρδιακού ρυθμού ανέδειξε παροξυσμική κολπική μαρμαρυγή, ως υποκείμενη αιτία των ισχαιμικών εγκεφαλικών.

Συζήτηση: Η εμπειρία μας από το παραπάνω περιστατικό δεικνύει την ασφάλεια της ενδοφλέβιας θρομβόλυσης ακόμα και σε περιπτώσεις ασθενών με πρόσφατη αιμόπτυση λόγω υποκείμενων βρογχεκτασιών.

Λέξεις ευρετηρίου: αιμόπτυση, βρογχεκτασίες, μαγνητική τομογραφία εγκεφάλου, οξύ ισχαιμικό αγγειακό εγκεφαλικό επεισόδιο, ενδοφλέβια θρομβόλυση

Manuscript

Introduction

Bronchiectasis, consisting an independent risk factor for ischemic stroke and coronary heart disease has been associated with severe complications of IVT in patients with acute myocardial infarction. However, there are scarce data regarding the safety of IVT in acute ischemic stroke.

Methods

We present the case of a 74-year-old woman who received intravenous thrombolysis for AIS despite recent hemoptysis due to underlying bronchiectasis.

Case Report

We describe the interesting case of a 74-year-old woman with medical history of extensive bronchiectasis due to multiple pulmonary infections in younger age and frequent episodes of hemoptysis (about 3 per month). The patient presented with acute onset of left hemiplegia and hemihypesthesia, dysarthria, gaze deviation and decreased level of consciousness (NIHSS-Score on admission: 22) within 75 min from symptom onset and a recent hemoptysis, about 8 hours ago, was also mentioned. Baseline axial brain CT scan on hospital admission (Figure; Panel A) disclosed right hyperdense middle cerebral artery (MCA) sign due to an underlying proximal MCA occlusion and values of hematologic/ coagulation testing was normal.

The patient was treated with systemic thrombolysis using alteplase standard dose (0.9 mg/kg over 60 minutes with initial 10% of dose given as bolus over 1 minute) with an onset-to-treatment-time of 110 minutes. During the first 30 min of alteplase infusion, substantial neurological improvement was documented (NIHSS-score 7), while Transcranial Color-coded Duplex disclosed complete recanalization of right M1-MCA (Thrombolysis in Brain Infarction grade 5). However, during administration and after having received about 70% of the total dose, alteplase-infusion had been interrupted due to recurrent transient hemoptysis. Contrast-enhanced chest-CT scan (Figure; Panel B) revealed the extensive cystic bronchiectasis, without any signs of active hemorrhage.

The patient experienced substantial clinical improvement and symptom resolution and her NIHSS-score at discharge was 2. During hospitalization paroxysmal atrial fibrillation (AF) was detected as the underlying cause of stroke, using cardiac monitoring.

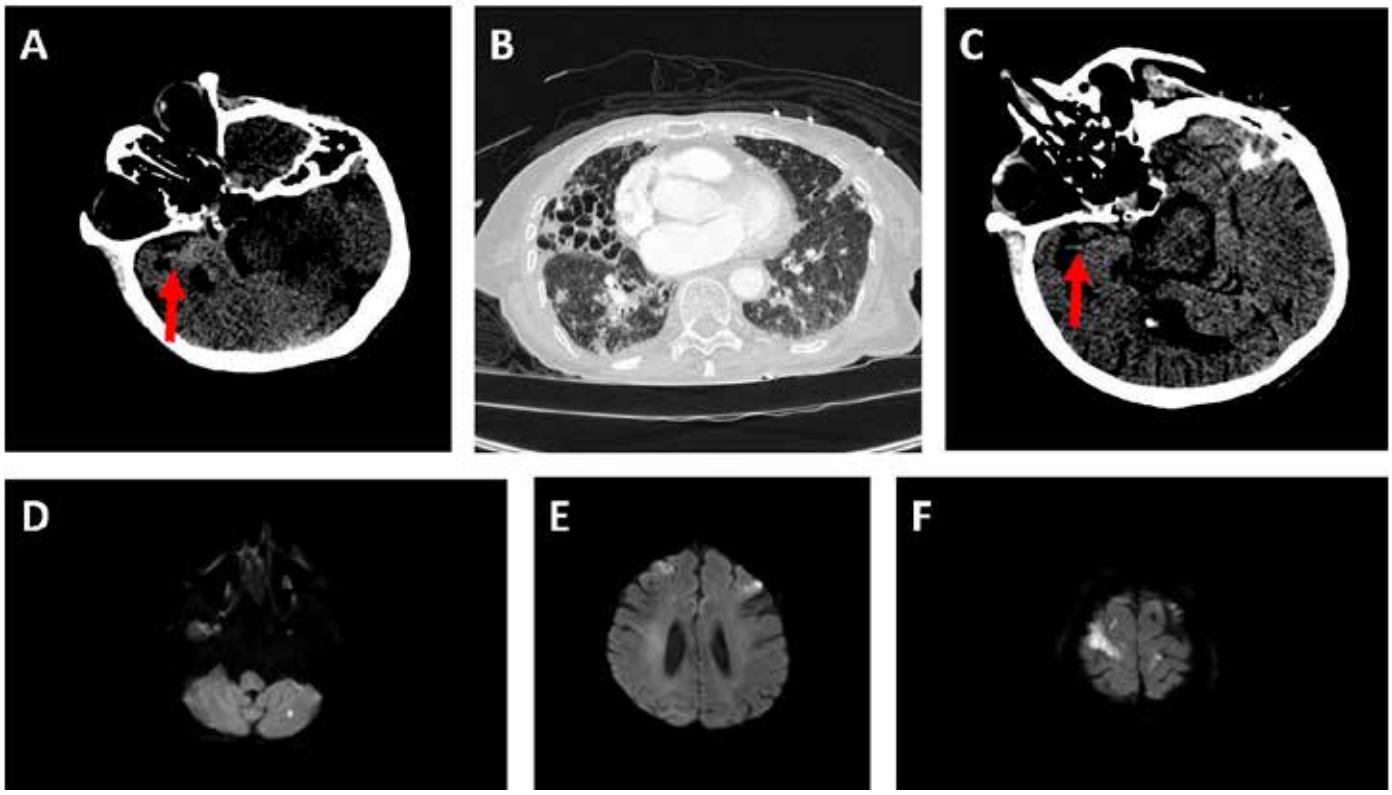
Brain-MRI disclosed acute cardioembolic infarctions in different arterial territories including right MCA (Figure; Panels D-F) without hemorrhagic complications. The patient was treated with antiplatelet therapy for the first 8 days of symptom onset and was then switched to weight-adjusted therapeutic dose of enoxaparin-sodium under regular control of the Anti-Factor-Xa level. The modified-Rankin-Scale Score was 1 at three months.

Discussion

Recent studies indicate, that bronchiectasis consists an independent risk factor for AIS and coronary heart diseases [1-2]. Chen et.al reported through a population-based cohort study from Asian population an incidence rate of 9.18 per 1000 person-years of ischemic stroke in patients with bronchiectasis compared to an incidence rate of 4.66 per 1000 person-years in patients without bronchiectasis [3]. Furthermore bronchiectasis coexisting with diabetes, AF, or hypertension represents a multiplicative risk of ischemic stroke.

However there are only rare case-reports, which describe severe complications in patients with bronchiectasis after administration of systemic thrombolysis for acute myocardial infarction, while international recommendations for the early acute ischemic stroke management of those patients are unavailable [4-6]. Additional, severe hemoptysis is not listed as a contraindication in the current SPC of Actilyse, despite this could be considered as a recent "severe" bleeding. Consequently, the decision to deliver IVT in a patient with acute ischemic stroke and a history of bronchiectasis with recent hemoptysis is an extremely

Figure. Neuroimaging-Findings in an acute ischemic stroke patient due to right middle cerebral artery occlusion with extensive bronchiectasis and recent hemoptysis



Axial brain CT scan on hospital admission disclosing right hyperdense MCA-sign (red arrow-A). Axial chest-CT scan of chest revealing extensive cystic bronchiectasis (B). Axial brain CT scan following r-tPA administration revealing resolution of hyperdense MCA-sign (red arrow-C). Diffusion-weighted imaging (DWI) reveals multiple acute cerebral infarctions in different arterial territories: right middle cerebral artery, left middle cerebral artery and left posterior inferior cerebellar artery (D-F)

demanding task for the treating neurologist, requiring a very quick analysis of the benefit/risk ratio of alteplase treatment for the individual patient.

To the best of our knowledge this is the first report, describing the IVT-administration despite the recent hemoptysis in an AIS patient with extensive known bronchiectasis. Our patient, despite our concerns, achieved significant clinical improvement and was discharged with minimal neurological deficits. Based on our experience this management appears to be not only effective, but also safe. However it is meaningful that these patients or their legal representatives should be informed about the higher risk of hemorrhagic complications following IVT-administration and signed informed consent should be obtained.

Concluding, additional publications are needed to clarify the safety of IVT in AIS with bronchiectasis with or without recent hemoptysis, given the high risk of pulmonary hemorrhage with possible fatal outcomes.

Declarations

Ethics approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to participate

Not applicable.

Consent for publication

The participant has given informed consent to the submission of the case report to the journal.

Availability of data and material

All data are presented in the manuscript.
Conflicts of interest/Competing interests.

Dr Theodorou reports no disclosures.
Dr Kotsali-Peteinelli reports no disclosures.
Dr Bregianni reports no disclosures.
Dr Palaiodimou reports no disclosures.
Dr Papadopoulou reports no disclosures.
Dr Maili reports no disclosures.
Dr Bonakis reports no disclosures.
Dr Voumvourakis reports no disclosures.
Dr Tsivgoulis reports no disclosures.

Funding

No funds, grants, or other support was received.

Authors' contributions

Study conception and design: GT.
Data collection, analysis and interpretation: AT, VKP, MB, LP.
Drafting and revising the manuscript: AT and GT.
Critical comments during manuscript revision: VKP, MP, AB, KV.
All authors read and approved the final manuscript.

Acknowledgments

None.

List of Abbreviations

IVT: intravenous thrombolysis.
AIS: acute ischemic stroke.
MCA**:** middle cerebral artery.
AF: atrial fibrillation.

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