

Search Strategy of literature database

1. MEDLINE + PMC (PubMed) Last running date of literature searching November 27th 2024.

#1: "torsade*" [Title/Abstract] OR "Torsades de Pointes" [MeSH Terms]

#2: "ventricular tachycardia*" [Title/Abstract] OR "VT" [Title/Abstract] OR "pVT" [Title/Abstract] OR "tachycardia, ventricular" [MeSH Terms:noexp]

#3: "long qt syndrome*" [Title/Abstract] OR "LQTS" [Title/Abstract] OR "Long QT Syndrome" [MeSH Terms] OR "QT Prolonged" [Title/Abstract] OR "QT Prolongation" [Title/Abstract] OR "Prolongation of the QT" [Title/Abstract] OR "QT interval Prolongation" [Title/Abstract] OR "prolonged QT" [Title/Abstract]

#4: ("arrhythmia" [Title/Abstract] OR "arrythmia" [Title/Abstract] OR "dysrhythmia" [Title/Abstract] OR "arrhythmias, cardiac" [MeSH Terms:noexp] OR "arhythmia" [Title/Abstract] OR "arythmia" [Title/Abstract] OR "arrhythmia" [Title/Abstract]) AND ("malignant" [Title/Abstract] OR "threatening" [Title/Abstract] OR "critical" [Title/Abstract] OR "fatal" [Title/Abstract])

#5: #1 OR #2 OR #3 OR #4

#6: "Magnesium Sulfate" [MeSH Terms] OR "Magnesium Compounds" [MeSH Terms:noexp] OR "Magnesium" [MeSH Terms] OR "Magnesium" [Supplementary Concept] OR "Magnesium Sulfate" [Title/Abstract] OR "mgso*" [Title/Abstract] OR "Magnesium" [Title/Abstract] OR "intravenous magnesium" [Title/Abstract] OR "IV Magnesium" [Title/Abstract]

#7: #5 AND #6

#8: 0001/01/01:2024/10/31 [Date - Create]

#9: #7 AND #8

2. Science Citation Index Expanded (Web of Science) Last running date of literature searching:, November 27th 2024.

#1: (TS=torsade*)

#2: (TS="ventricular tachycardia*") OR (TS=VT) OR (TS=pVT)

#3: (TS="long qt syndrome*") OR (TS=LQTS) OR (TS="prolonged QT") OR (TS="QT prolonged") OR (TS="QT prolongation") OR (TS="Prolongation of the QT") OR (TS="QT interval Prolongation") OR (TS="prolonged QT")

#4: ((TS=arrhythmia) OR (TS=arrythmia) OR (TS=dysrhythmia) OR (TS=Arhythmia) OR (TS=Arythmia) OR (TS=Arrhythmia)) AND ((TS=malignant) OR (TS="threatening") OR (TS=critical) OR (TS=fatal))

#5: #1 or #2 or #3 or #4

#6: (TS="Magnesium Sulfate") OR (TS=mgso*) OR (TS=Magnesium) OR (TS="intravenous magnesium") OR (TS="IV Magnesium")

#7: #5 AND #6

#8: #7 with index date from 1973-01-01 to 2024-10-31

3. Cochrane Central Register of Controlled Trials(Cochrane Library) Last running date of literature searching, November 27th 2024.

#1: torsade*:ti,ab,kw OR [mh "Torsades de Pointes"]

#2: ("ventricular" NEXT tachycardia*):ti,ab,kw OR VT:ti,ab,kw OR pVT:ti,ab,kw OR [mh ^"tachycardia, ventricular"]

#3: ("long qt" NEXT syndrome*):ti,ab,kw OR LQTS:ti,ab,kw OR "prolonged QT":ti,ab,kw OR "QT prolonged":ti,ab,kw OR "QT Prolongation":ti,ab,kw OR "Prolongation QT":ti,ab,kw OR "QT interval Prolongation":ti,ab,kw OR [mh "Long QT Syndrome"] OR "Prolongation of the QT":ti,ab,kw OR "prolonged QT":ti,ab,kw

#4: (arrhythmia:ti,ab,kw OR arrhythmia:ti,ab,kw OR dysrhythmia:ti,ab,kw OR [mh ^"arrhythmias, cardiac"]) OR arhythmia:ti,ab,kw OR arythmia:ti,ab,kw OR arrhytmia:ti,ab,kw) AND (malignant:ti,ab,kw OR threatening:ti,ab,kw OR critical:ti,ab,kw OR fatal:ti,ab,kw)

#5: #1 OR #2 OR #3 OR #4

#6: [mh "Magnesium Sulfate"] OR [mh ^"Magnesium Compounds"] OR [mh Magnesium] OR "Magnesium Sulfate":ti,ab,kw OR mgso*:ti,ab,kw OR Magnesium:ti,ab,kw OR "intravenous magnesium":ti,ab,kw OR "IV Magnesium":ti,ab,kw

#7: #5 AND #6

#8: #7 with Date added to CENTRAL trials database from 01/01/0001 to 31/10/2024

4. Japana Centra Revuo Medicina/Igaku Chuo Zasshi(Ichushi-Web) Last running date of literature searching, November 26th 2024..

#1 : torsade/TA or トルサード/TA or トルサド/TA or トルサデ/TA or "Torsades de Pointes"/TH

#2: "Ventricular Tachycardia"/TA or VT/TA or 心室頻拍/TA or 心室性頻拍/TA or 頻拍-心室性/TH

#3: "Long QT Syndrome"/TA or LQTS/TA or "QT prolonged"/TA or "prolonged QT"/TA or "QT Prolongation"/TA or "Prolongation of QT"/TA or "Prolongation of the QT"/TA or QT 延長症候群/TH or "QT interval Prolongation"/TA

#4: (((Arrhythmia/TA or Arrythmia/TA or Dysrhythmia/TA or Arhythmia/TA or Arythmia/TA or Arrhytmia/TA or 不整脈/TA or @ "不整脈"/TH) and (malignant/TA or 致死性/TA or 致死的/TA))) or (悪性不整脈/TA))

#5: #1 or #2 or #3 or #4

#6: "Magnesium Sulfate"/TA or mgso/TA or magnesium/TA or マグネシウム/TA or "Magnesium Sulfate"/TH

#7: #5 and #6

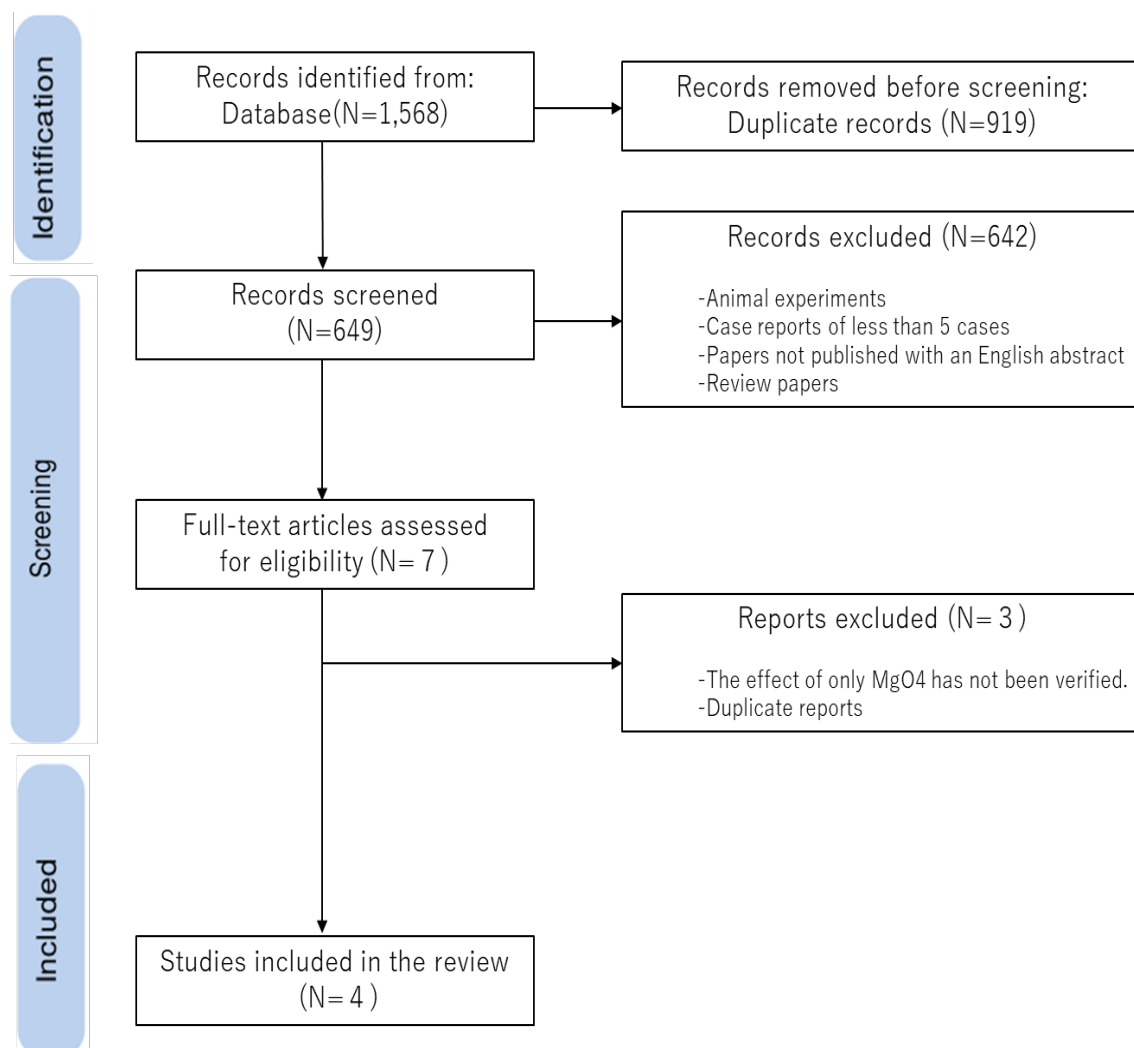
#8: DT=0001:2024 and PDAT=0001/01/01:2024/10/31

#9: #7 and #8

#10: (PT=原著論文)

#11: #9 and #10

Study flow chart



Summary of four studies evaluating the safety and efficacy of intravenous magnesium for TdP

Study name	Study design	Sample size (Mg alone: N)	Summary	Clinical outcomes			
				Benefits	Harms		
				Termination of TdP by Mg alone	Mortality (short-term)	Progression to VF	Serious side effect
Gowda RM et al (Int J Cardiol 2004)	Cohort study	18	<p>Patients: TdP after the infusion of ibutilide (N=58)</p> <p>Treatment: Mg administration (N=21: study group)</p> <ul style="list-style-type: none"> - MgSO4 alone: N=18 (31%) - MgSO4 +lidocaine: N=3 (5%) <p>No Mg administration (N=37: control group)</p> <ul style="list-style-type: none"> - EC alone: N=11 (19%) - precordial thump: N= 2 (3%) - without treatment: N=24(41%) <p>Results: Progression to VF: study group (N=10), control group (N=11)</p> <p>Survival: No death (N=58)</p>	8/18 (44.4%)	0/18 (0%)	10/18 (55.6%)	0/18 (0%)
Manz M et al (Herz 1997)	Cohort study	4	<p>Patients: TdP (N=4: study group) persistent monomorphic VT (N=25: control group)</p> <p>Treatment: magnesium glutamate (2 x 1,000 mg intravenously):</p> <ul style="list-style-type: none"> - study group (N=4), - control group (N=25) <p>Results: (Study group) TdP terminated: N=4 (100%)</p> <p>(Control group) TdP terminated: N=8 (32%)</p>	4/4 (100%)	0/4 (0%)	0/4 (0%)	0/4 (0%)
Perticone F et al (Clin Drug Invest 1997)	Case series reports	12	<p>Patients: TdP with acquired prolonged QT interval (N=12)</p> <p>Treatment: MgSO4 infusion in 0.9% sodium chloride at a slow rate (50mg/min). MgSO4 infusion continued for 2 h, prophylactic infusion twice a day over the next 3-4 days.</p> <p>Other treatment: potassium therapy after MgSO4 infusion: N=2</p> <p>Results: TdP disappeared within 20-30 min: N=12 (100%)</p> <p>Progression to VF: N=0 (0%)</p> <p>Serious side effect: N=0 (0%)</p>	12/12 (100%)	0/12 (0%)	0/12 (0%)	0/12 (0%)
Tzivoni D et al (Circulation 1988)	Cohort study	12	<p>Patients: TdP with QT prolongation (N=12: study group) polymorphous VT normal QT interval (N=5: control group)</p> <p>Treatment: MgO4 administration: N=17 (100%)</p> <ul style="list-style-type: none"> - bolus infusion: N=17 (100%) - continuous infusion after bolus infusion (3-20 mg/min): N=9 (75%: preventive [N=6], not preventive [N=3]) <p>Other therapies: supplementation of potassium (study group: N=8)</p> <p>Results: Disappearance of TdP :</p> <p>(Study group: N=12) TdP terminated after a single MgO4 bolus injection: N=9 (75%)</p> <p>TdP terminated after the second MgO4 bolus injection: N=3(25%)</p> <p>(Control group: N=5) TdP was not terminated by MgO4 bolus injection in all 5 cases: N=0 (0%)</p> <p>Survival: No death (N=17)</p>	12/12 (100%)	0/12 (0%)	0/12 (0%)	0/12 (0%)
All	—	46	—	36/46 (78.3%)	0/46 (0%)	10/46 (21.7%)	0/46 (0%)