Table 1. Characteristics of studies included in the systematic review

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| --- | --- | --- | --- | --- | --- | --- |
| First of author  Year | Country | Intervention | | | Sample  size | Jade  score |
| Drugs | Route | Dosage |
| Abbasinazari  2011 | Iran | Allopurinol  Placebo | Oral | 300 mg at 3 h and 300 mg before doing ERCP | 29  45 | 3 |
| Abu-Safieh  2014 | Palestine | Diclofenac  Placebo | IM | 75 mg before ERCP | 89  93 | 3 |
| Andrade-Dávila  2015 | Mexico | Indomethacin  Placebo | Rectal | 100 mg after ERCP | 82  84 | 3 |
| Andriulli  2002 | Italy | Somatostatin  Placebo  GAB | IV | somatostatin: 0.75mg Gabexate: 500mg  before ERCP and continuing 6h afterward | 183  199  197 | 5 |
| Andriulli  2004 | Italy | Somatostatin  Placebo  GAB | IV | somatostatin: 0.75mg; Gabexate: 500mg  before ERCP and continuing 6h afterward | 351  395  381 | 5 |
| Arcidiacono  1994 | Italy | Octreotide  Placebo | IH | 0.1 mg, 2 h and 30 min before and 4 h after ERCP | 75  76 | 4 |
| Armonis  1994 | USA | Octreotide  Placebo | IH | 0.1 mg, 30 min before ERCP | 84  88 | 4 |
| Arvanitidis  1998 | Greece | Octreotide  Placebo | IH | 0.1 mg, 30 min before and 8 and 16 hours after the procedure | 37  36 | 5 |
| Arvanitidis  2004 | Greece | Somatostatin  Placebo | IV or Bolus | 3 mg, over 12 h (starting 1 h before ERCP) | 234  122 | 5 |
| Badra  2000 | Egypt | Octreotide  allopurinol | IH/Oral | Octreotide: 0.5 mg, 1 h before ERCP  Allopurinol: 300 mg, before ERCP | 27  27 | 4 |
| Bai  2015 | China | Somatostatin  Placebo | IV | 3000µg, before ERCP | 445  455 | 4 |
| Baldazzi  1994 | Milano | Octreotide  Placebo | IH | 0.1 mg, 45 min before and 6h after ERCP | 50  50 | 5 |
| Beauchant  2008 | France | GTN  Placebo | Bolus | 0.1 mg, at 10 min before ERCP, then 35 ug/kg/min for 6 h | 105  103 | 5 |
| Bhatia  2011 | India | GTN  Placebo | Transdermal | 10 mg/h, 30 minutes before ERCP | 124  126 | 3 |
| Binmoeller  1992 | France | Octreotide  Placebo | IV | 0.1 mg, 5 min before and immediately after ERCP | 121  124 | 3 |
| Bordas  1998 | Spain | Somatostatin  Placebo | Bolus | 4 mg/kg, start of cannulation | 17  16 | 5 |
| Bordas  1998 | Spain | Somatostatin  Placebo | Bolus | 4 ug/k, at the beginning of ERCP | 80  80 | 4 |
| Budzynska  2001 | Poland | Allopurinol  Placebo | Oral | 200 mg, at 15 h and 3 h before ERCP | 99  101 | 5 |
| Cavallini  1996 | Italy | Gabexate mesylate  Placebo | IV | 1g, starting 30 to 90 minutes before endoscopy and continuing for 12 hours after ERCP | 208  210 | 5 |
| Chan  2008 | Taiwan | Somatostatin  Placebo | Bolus | 0.25mg, at the beginning of cannulation | 84  49 | 4 |
| Chen  2012 | China | GTN  VC | Subligual | 0.5mg, 5min before ERCP, then 35 ug/kg/min for 6 h | 74  73 | 4 |
| Chen  2015 | China | Ulinastatin  Placebo | IV | 100,000 U, daily for 3 days, 1 day before, on the day, and 1 day after ERCP | 112  124 | 5 |
| Cheon  2007 | USA | Diclofenac  Placebo | Oral | 50 mg, 30-90 minutes orally before ERCP and 4-6 hours after ERCP | 105  102 | 5 |
| Choi  2009 | Korea | Nafamostat  Placebo | IV | 20 mg, over 24 h Before ERCP | 354  350 | 5 |
| Concepcion  2014 | Spain | Somatostatin  Placebo | Bolus | 0.25 mg/h\*4h, at the beginning of cannulation | 255  255 | 3 |
| Döbrönte  2012 | Hungary | Indomethacin  Placebo | Rectal | 100 mg, 10 minutes before ERCP | 130  98 | 2 |
| Döbrönte  2014 | Hungary | Indomethacin  Placebo | Rectal | 100 mg, 10-15 minutes before premedication | 347  318 | 2 |
| Duvnjak  1999 | Croatia | Octreotide  Placebo | IH | 0.5 mg, 1 h before | 104  105 | 5 |
| Elmunzer  2012 | USA | Indomethacin  Placebo | Rectal | 100 mg, immediately after ERCP | 295  307 | 5 |
| Fujshiro  2006 | Japan | Ulinastatin  Gabexate | IV | Ulinastatin: 50,000 U/150,000, 1 h before, during and 11 h after the ERCP procedure Gabexate: 900 mg, continuous 13 h, beginning from 1 h before ERCP | 93  46 | 5 |
| Ghori  2002 | UK | GTN  Placebo | Subligual | 0.4-0.8mg, before ERCP | 128  126 | 4 |
| Hao  2009 | China | GTN  Placebo | Subligual | 5mg, before ERCP | 38  36 | 3 |
| Hosseini  2017 | Iran | Indomethacin  Placebo | Rectal | 100 mg, two hours before the ERCP | 100  105 | 3 |
| Hosseini  2016 | Iran | Indomethacin  Placebo | Rectal | 100 mg, before the ERCP | 100  100 | 3 |
| Itaba  2013 | Japan | Ulinastatin  Placebo | IV | 15,000 U, 2 h from the start of the procedure | 23  21 | 5 |
| Kaffes  2006 | Australia | GTN  Placebo | Transdermal | 5 mg, 60 minutes before ERCP | 155  163 | 3 |
| Katsinelos  2000 | Greece | Octreotide  Placebo | Bolus | 100mg, 30 min and one hour respectively before and after ERCP as an intravenous bolus injection | 73  74 | 4 |
| Katsinelos  2005 | Greece | Allopurinol  Placebo | Oral | 600 mg, at 15 h and 3 h orally before ERCP | 125  118 | 5 |
| Khoshbaten  2008 | Iran | Diclofenac  Placebo | Rectal | 100 mg, after ERCP within 1 hour | 50  50 | 4 |
| Kisli  2007 | Turkey | Octreotide  Placebo | IV | 0.1 mg, 60 minutes before ERCP | 33  87 | 5 |
| Lee  2008 | Korea | Somatostatin  Placebo | IV | 0.25 mg/h\* 12 h, 30min before ERCP | 193  198 | 5 |
| Levenick  2016 | USA | Indomethacin  Placebo | Rectal | 2 \* 50 m, during ERCP | 223  226 | 5 |
| Li  2007 | China | Octreotide  Placebo | IM | 0.3m, before ERCP | 414  418 | 3 |
| Lua  2015 | Malaysia | Diclofenac  Placebo | Rectal | 100 mg, after ERCP | 69  75 | 2 |
| Luo  2016 | China | Indomethacin  Placebo | Rectal | 100 m, within 30 min before ERCP | 992  1022 | 4 |
| Manes  2007 | Italy | Gabexate mesylate  Placebo | IV | 500 mg, over 6 h before/after ERCP | 406  202 | 5 |
| Manolakopoulo  2002 | Greece | Octreotide  Placebo | IH | 0.1 mg, 30 min before ERCP | 112  115 | 3 |
| Martinez-torres  2009 | Mexico | Allopurinol  Placebo | Oral | 300 mg at 15 h and 300 mg at 3 hbefore ERCP | 85  85 | 4 |
| Mohammad  2017 | Iran | Diclofenac  Indomethacin | Rectal | 100mg diclofenac/indomethacin before ERCP | 124  122 | 5 |
| Montaño Loza  2007 | México | Indomethacin  Placebo | Rectal | 100 m, two hours before the procedure | 75  75 | 3 |
| Moreto  2003 | Span | GTN  Placebo | Transdermal | 15 mg, 30–40min before ERCP | 71  73 | 5 |
| Mosler  2005 | USA | Allopurinol  Placebo | Oral | 600 mg at 4 h and 300 mg at 1 h before ERCP | 355  346 | 5 |
| Murray  2003 | Scotland | Indomethacin  Placebo | Rectal | 100 mg, 2 hours before ERCP | 110  110 | 4 |
| Nashaat2010 | Egypt | GTN  Placebo | Transdermal | 15mg, 2 h before ERCP | 40  40 | 4 |
| Ng  1997 | Taiwan | Octreotide  Placebo | IH | 0.1 mg, 30 min before ERCP | 29  30 | 3 |
| Nojgaard  2009 | France | GTN  Placebo | Transdermal | 15 mg, 30 to 45 minutes before ERCP | 401  405 | 3 |
| Ohuchida  2015 | Japan | Nafamostat  Placebo | IV | 21 mg, over 24 h before ERCP | 405  404 | 5 |
| Otsuka  2012 | Japan | Diclofenac  Placebo | Rectal | 50 mg (25 mg, if body weight <50 kg), 30 minutes before ERCP | 51  53 | 2 |
| Park  2015 | Korea | Nafamostat  Placebo | IV | 20 or 50 mg, over 24 h before ERCP | 208  200 | 4 |
| Park  2014 | Korea | Ulinastatin  nafamostat  Placebo | IV | 150,00U, before ERCP to 6-8 h after ERCP | 53  53  53 | 4 |
| Park  2015 | Korea | Diclofenac  Placebo | IM | 90 mg, immediately after ERCP | 173  170 | 5 |
| Patai  2015 | USA | Indomethacin  Placebo | Rectal | 100 mg, within 1 hour before ERCP | 270  269 | 5 |
| Persson  1992 | Sweden | Somatostatin  Placebo | IV | 0.25mg/h\*12h, 30min before ERCP | 26  28 | 3 |
| Poon  1999 | Hongkong | Somatostatin  Placebo | IV | 0.25mg/h\*12h, 30min before ERCP | 109  111 | 5 |
| Poon  2003 | Hongkong | Somatostatin  Placebo | Bolus | 0.25 m, at the beginning of cannulation | 135  135 | 5 |
| Romagnuolo  2008 | USA | Allopurinol  Placebo | Oral | 300 mg at 1 h before ERCP | 293  293 | 5 |
| Russo  1992 | Italy | Octreotide  Placebo | IV | 0.1 m, 30 min before and 8,16 h after ERCP | 50  50 | 5 |
| Sotoudehmane sh  2007 | Iran | Indomethacin | Rectal | 100mg, immediately before ERCP | 221  221 | 4 |
| Sternlieb  1992 | USA | Octreotide  Placebo | IV | 0.1mg, 5 min before and 45 min after ERCP | 40  44 | 3 |
| Sudhindran  2001 | UK | GTN  Placebo | Subligual | 2 mg, 5 min before ERCP | 90  96 | 5 |
| Talwar  2005 | UK | GTN  Placebo | Topical | 5 mg, before ERCP | 52  52 | 5 |
| Testoni  1994 | Italy | Octreotide  Placebo | IH | 0.2 mg,at 8,16,0 o’clock the day before and 8 o’clock the day of ERCP | 58  56 | 5 |
| Testoni  1994 | Italy | Octreotide  Placebo | IV | 0.2 mg, tid the days before till 2 days after ERCP | 20  20 | 3 |
| Testoni  1996 | Italy | Octreotide  Placebo | IV | 0.2 mg, tid the days before till 2 days after ERCP | 30  30 | 3 |
| Thomopoulos  2006 | Greece | Octreotide  Placebo | IV | 0.5 mg, at 8,16,0 o’clock the day before and at 8,16 o’clock the day of ERCP | 100  101 | 5 |
| Tsujino  2005 | Japan | Ulinastatin  Placebo | IV | 150,000 U, immediately before ERCP | 204  202 | 4 |
| Tulassay  1991 | Hungary | Octreotide  Placebo | IV | 0.1 mg, prior to and 45 min after ERCP | 29  34 | 3 |
| UÇAR  2016 | Turkey | Diclofenac  Placebo | IV | 100 mg/75 mg, 30–90 min before the procedure | 100  50 | 2 |
| Ueki  2007 | Italy | Gabexate mesylate  UTI | IV | Ulinastatin: 150,000 U, continuous until 22 h afterward;  Gabexate: 600 mg continuous until22 h afterward | 34  34 | 5 |
| Ueki  2007 | Japan | Ulinastatin  Gabexate | IV | Ulinastatin: 150,000 U/Gabexate: 600mg, beginning 60-90 min before and continuing until 22 h after the ERCP | 34  34 | 5 |
| Wang  2013 | China | Somatostatin  Placebo | IV | 0.25mg\*24h, 1h before ERCP | 83  41 | 5 |
| Wang  2014 | china | Ulinastatin  Placebo | IV | 20 mg, before ERCP | 160  120 | 3 |
| Wehrmann  2001 | Germany | GTN  Placebo | Topical | 10 mg, at ERCP | 40  40 | 3 |
| Xiong  2005 | China | Gabexate mesylate  Placebo | IV | 300 mg, over 4 h ERCP | 98  95 | 5 |
| Yoo  2011 | Korea | Nafamostat  Placebo | IV | 50 mg, over 6 h Before ERCP | 143  143 | 5 |
| Yoo  2008 | Korea | Ulinastatin  Placebo | IV | 100,000 U continuous for 5.5 h, just after ERCP | 119  108 | 4 |
| Zhao  2014 | China | Somatostatin  Placebo | IV | 0.25mg\*24h, 1h before ERCP | 207  97 | 5 |

GAB, Gabexate mesylate; GTN, Glyceryl Trinitrate; IH, hypodermic injection; IM, intramuscular injection; IV, intravenous injection.