Supplementary information

Figure S1. Flow diagram of study selection

Table S1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Checklist

Table S2. Cutaneous Signs, Treatment Response and Clinical Outcomes of Patients with Myelodysplastic Syndrome

Table S3: Quality assessment of included studies (see excel document)

Appendix S1. References of included studies

**Figure S1.** Flow diagram of study selection

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**Figure S1 Legend.** CMML, chronic myelomonocytic leukaemia; MDS, myelodysplastic syndrome; MPD, myeloproliferative neoplasm; RAEB-t, refractory anaemia with excess blast in transformation; WHO, world Health Organisation.

**Table S1.** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Checklist

|  |  |  |  |
| --- | --- | --- | --- |
| **Section/topic**  | **#** | **Checklist item**  | **Reported on page #**  |
| **TITLE**  |
| Title  | 1 | Identify the report as a systematic review, meta-analysis, or both.  | Page 1 |
| **ABSTRACT**  |
| Structured summary  | 2 | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.  | NA |
| **INTRODUCTION**  |
| Rationale  | 3 | Describe the rationale for the review in the context of what is already known.  | Page 4 |
| Objectives  | 4 | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).  | Page 4 |
| **METHODS**  |
| Protocol and registration  | 5 | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.  | Page 4 |
| Eligibility criteria  | 6 | Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.  | eMethods |
| Information sources  | 7 | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.  | Page 4 |
| Search  | 8 | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.  | eMethods |
| Study selection  | 9 | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).  | eMethods |
| Data collection process  | 10 | Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.  | eMethods |
| Data items  | 11 | List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.  | eMethods |
| Risk of bias in individual studies  | 12 | Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.  | NA |
| Summary measures  | 13 | State the principal summary measures (e.g., risk ratio, difference in means).  | eMethods |
| Synthesis of results  | 14 | Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I2) for each meta-analysis.  | NA |
| Risk of bias across studies  | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).  | NA |
| Additional analyses  | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.  | NA |
| **RESULTS**  |
| Study selection  | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.  | eFigure 1 |
| Study characteristics  | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.  | eTable 1 |
| Risk of bias within studies  | 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).  | NA |
| Results of individual studies  | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.  | Table 1, eTable 1 |
| Synthesis of results  | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency.  | NA |
| Risk of bias across studies  | 22 | Present results of any assessment of risk of bias across studies (see Item 15).  | NA |
| Additional analysis  | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).  | NA |
| **DISCUSSION**  |
| Summary of evidence  | 24 | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).  | Page 4, 5 |
| Limitations  | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).  | Page 5 |
| Conclusions  | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research.  | Page 5 |
| **FUNDING**  |
| Funding  | 27 | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.  | Title page |

**Table S2.** Cutaneous Signs, Treatment Response and Clinical Outcomes of Patients with Myelodysplastic Syndrome

| Study, Year | Age, Sex | MDS type | Onseta(month) | Cutaneous Signs (n) | Treatment and Response | Clinical Outcomes n (%) Survival |
| --- | --- | --- | --- | --- | --- | --- |
| Case reports |  |  |  |  |  |
| Antic, 2013 | 76, F | RAEB-1 | –6 | **Other/Erythematous firm plaques***Site: cheek*  | For local radiotherapy, lost to f/u, refused | Lost to follow up |
| Arandes-Marcocci, 2015 | 80, M | RAEB-1 | –0.75 | **Other/Myelodysplasia cutis***Site: upper limb* | 5-azacitidine - cutaneous lesions almost disappeared. | 0 (0%) survival*Cause of death:* haemorrhagic complications.18 months later  |
| Ashida,2006 | 53, M | RAEB | NA | **Neutrophilic/Sweet syndrome***Site:* *scrotum, face and oral cavity* | Prednisolone 60mg/day; combo chemo (aclarubicin and cytosine arabinoside), allogenic bone marrow stem cell transplantation (busulfan 8 mg/kg PO and fludarabine 180 mg/m2 IV); G-CSF 5 mg/kg/day.  | 1 (100%) survival RemissionTime not reported |
| Balin, 2011 | 71, M | Unspecified | 10 | **Granulomatous/interstitial granuloma annulare***Site: trunk, upper and lower extremities* | Hydrochloroquine sulfate 200mg BD – no improvementLenalidomide – skin improved after 6 weeks | 0 (0%) survival*Cause of death:* AML, pneumonia, 12 weeks after presentation |
| Bhattacharjee,2004 | 52, M | Unspecified  | +1 | **Other/Multiple eruptive dermatofibromas***Site: abdomen, back, arms and legs*  | NA | 1 (100%) survival No change in lesions |
| Chamoun,2018 | 76, M | Unspecified | NA | **Other/Violaceous plaques***Site:* *Abdomen*  | CD123‐targeted therapy with SL‐401. | 1 (100%) survival Remission |
| Chen, 2004 | 59, M | RAEB | 0 | **Panniculitis/neutrophilic panniculitis***Site:* *face, trunk, back, and extremities; whole body* | Systemic antibiotic (no improvement)Prednisolone 40mg OD 0.5mg/kg (rapid improvement; reintroducted as intermittent fever persisted) | 0 (0%) survival*Cause of death:* septic shock and pneumonia lung infection. (16 months later) |
| Choi, 2006 | 80, M | Unspecified | –5 | **Neutrophilic/Sweet syndrome***Site*: *trunk and extremities* | Prednisolone, dapsone 50mg OD | 1 (100%) survival Stable, symptom recurred after treatment |
| de Arruda Camara,2008 | 82, M | Unspecified | +11 | **Other/Sarcoma, nodules** *Site: trunk, face, scalp and extremities* | Platelet transfusions | 0 (0%) survival*Cause of death:* pulmonary haemorrhage and cardiovascular arrest six months after the diagnosis of granulocytic sarcoma  |
| Delplanque, 2019 | 67F | Multilineage dysplasia | +12 | **CTD/CLE***Site: hands, thighs, breast and face* | hydroxychloroquine, topical and oral steroid | 1 (100%) survival*Good response* |
| Farmakis, 2015 | 82, M | Unspecified | –6 | **Vasculitis/Leukocytoclastic vasculitis***Site: lower limbs* | RBC, filgrastim and epoetin alfa, methylpred 50mg OD | 0 (0%) survival*Cause of death: progressive gangrene 3 months later* |
| Fein, 2000 | 74, M | Unspecified | –6 | **Vasculitis/Asymptomatic purpura** *Site: forearm* | NA | NA |
| Goto, 2006 | 74, M | Unspecified | +24 | **Neutrophilic/PG***Site: lower limb, fingers* | Prednisolone 60mg OD, tapered down to 40mg OD (responded initially) | 0 (0%) survival*Cause of death:* *patient died 3 months after admission* |
| Gubinelli, 2003 | 65, M | RAEB | +12 | **Neutrophilic/Sweet syndrome***Site: lower limbs, trunk, hands* | Prednisone (10 mg/day).+ EPO (10,000 UI 3 times/week) + dapsone 100 mg/day | 1 (100%) survival*Remission* |
| Hagiwara, 2008 | 64, M | RAEB-2 | –12 | **Granulomatous/IGD***Site: leg trunk, face* | Prednisolone 30 mg/day, nicotinic acid amide 1.5 mg/day, doxycyclinehydrochloride 200 mg/day  | 1 (100%) survivalRemission |
| Hattori 2003 | 69, M | Single lineage dysplasia | +4 | **Neutrophilic/Sweet syndrome***Site: legs* | NA | NA |
| Hojo, 2004 | 73, M | Single lineage dysplasia | +3 | **Other/Tender erythematous nodules***Site: abdomen, thighs, back* | Prednisolone at 40mg/day | 1 (100%) survival*Good*  |
| J Ten Oever, 2018 | 73, M | RAEB-2 | +12 | **Neutrophilic/Sweet syndrome (Histiocytoid)***Site: trunk, upper extremities* | Prednisone 70 mg/day, weaning dose and doxycycline 10/13 months. Recurred on tapering. | 0 (0%) survival*Cause of death: bilateral pneumonia / progressed to myeloid sarcoma* |
| Kakaletsis, 2014 | 1 | RAEB | 0 | **Neutrophilic/Sweet syndrome – lymphocytic***Site: trunk, face, extremities* | Broad spectrum antibiotics and antifungalsTopical corticosteroids (resolved)Azacitidine  | NA |
| Kamimura, 2021 | 62, M | Single lineage dysplasia | –2 | **Neutrophilic/Sweet syndrome***Site: chest, upper arm* | oral prednisolone (20 mg/day) + treatment with corticosteroid pulse therapy, followed by azacitidine | 0 (0%) survival*Cause of death: MDS progressed* |
| Kawakami, 2008 | 76, M | Unspecified | +14 | **Others/cutaneous extramedullary haematopoiesis mass***Site:* *scalp, chest, abdomen, back, and extremities* | Prednisolone + hydroxyurea (500 mg/d) + methylprednisolone- pulse regimen consisting of 1000 mg for 3 days, 350 mg/d of cyclosporine | 0 (0%) survival*Cause of death:* *Developed a blast crisis, renal failure* |
| Khodadad, 2005  | 30, M | RAEB-2 | –1 | **Neutrophilic/Sweet syndrome***Site: face, chest, upper and lower limbs* | Cloxacillin and ceftazidime (resistant)Prednisolone 60mg/day (resolved), discharged on 20mg/day | 0 (0%) survival*Cause of death:* *minimally differentiated acute myelogenous leukemia (AML-M0) 1 year later* |
| Kim,2020 | 48, F | RAEB-1 | 0 | **Neutrophilic/PG***Site: forehead* | 2/52 IV methylprednisolone (80 mg/day) -> skin lesions improved dramatically after 2 weeks. Chemotherapy with methylprednisolone (20 mg/day)  | 1 (100%) survival RemissionGood response |
| Komiya,1990 | 54, M | RAEB | –2 | **Neutrophilic/Sweet syndrome***Site: face, neck, chest, and upper extremities* | Oral prednisone 20mg OD (improved) | 0 (0%) survival*Cause of death:* Died 4 months after cutaneous features from multiple aspergillomas and fungal emboli in lungs/shock |
| Lee,2011 | 67, M | RAEB | +3 | **Immunobullous/Bullous pemphigoid***Site:* *limbs, especially acral region* | Oral prednisolone 30 mg daily (0.5 mg /kg/day) and azathioprine 100 mg daily. | 1 (100%) survival RemissionRapid response |
| Lee,2016 | 44, M | Multilineage dysplasia | 0 | **Vasculitis/Unclassified vasculitis***Site: lower legs* | IV methylprednisolone (1 mg/ kg)  | 1 (100%) survival RemissionRapid response |
| Lerman,2019 | 70, M | RAEB | 0 | **CTD/Dermatomyositis***Site:* *scalp; bilateral hands* | Chemotherapy: azacytidine and pevonedistat Topical triamcinolone 0.1% and tacrolimus 0.1% ointment  | 1 (100%) survival Remission |
| Litvak, 2000 | 63, M | Unspecified  | NA | **Neutrophilic/PG***Site: R shin* | Prednisolone 40mg daily, cyclosporine 100mg twice a day, whirlpool therapy and split thickness skin graft. | 1 (100%) survival*Good response* |
| Martinelli, 2014 | 66, M | RAEB-2 | –24 | **Neutrophilic/Sweet syndrome***Site: upper limb, trunk, neck, face* | 1. IV methylprednisolone, colchicine,indomethacin, dapsone, minocycline andmethotrexate. (refractory)2.5-Aza (improvement from 2nd cycle onwards) | 1 (100%) survival*Remission* |
| Martinez-Garcia,2020 | 54, M | Single lineage dysplasia | +24 | **Other/Xanthogranulomas***Site*: trunk | No treatment | 1 (100%) survival Stable |
| Marullo, 1989  | 62, F | RAEB | –2 | **Neutrophilic/Sweet syndrome***Site: forehead, arms, thighs, legs* | RBC, amikacin 700mg OD, ceftriaxone 1gm/day for 1 week without any clinical improvement. Isoniazide 200mg OD 3 weeks (no response). Prednisolone 0.75mg/kg/day f | 0 (0%) survival*Cause of death:Llisterial meningitis after 3 months* |
| Mégarbane,2000 | 34, M | RAEB | –2 | **Neutrophilic/Sweet syndrome***Site:* *neck, face, legs, oral mucosa*  | IV methyloped 1g, oral pred 1mg/kg OD. Ticarcilin/clauvulanic acid and gentamicin (resolved)Bone marrow transplant and cyclophosphadmie (good) Relapse after tapering. | 1 (100%) survival Remission |
| Mizes,2020 | 59, F | Unclassifiable | +3 | **Neutrophilic/Sweet syndrome***Site:* *lower extremities* | IV methylprednisolone + 6-week oral prednisone taper. | NA |
| Nakanishi,2015 | 66, F | Multilineage dysplasia | –7 | **CTD/Dermatomyositis***Site:* *shoulders, elbows, knees and hips* | Oral prednisolone 40 mg OD for skin lesions Supportive care with blood transfusion | 0 (0%) survival*Cause of death:* respiratory failure (linked to NSIP flare-up) 53 days after her admission |
| Namba,1999 | 50, F | RAEB | +12 to 24 | **Others/Nodules***Site: scalp; extremities* | 1. Transfusion and chemotherapy 2. Radiation and oral steroids, not effective. | 0 (0%) survival*Cause of death:* Feb 1996 from MOF, AML |
| Nawata,2017  | 26, M | Multilineage dysplasia | 0 | **CTD/Dermatomyositis***Site:* *extremities* | Methylprednisolone 1g/day, oral prednisolone (1 mg/kg/day), and cyclosporine A IV | 1 (100%) survival Remission |
| Nifosì,2001 | 38, M | Single lineage dysplasia | 0 | **Neutrophilic/Sweet syndrome***Site:* *limbs* | 1. Corticosteroid therapy, colchicine (ineffective) 2. Indomethacin 150 mg / day, substitutive therapy. | 1 (100%) survival Remission |
| Nishie,2002 | 63, M | Unspecified | –18 | **Neutrophilic/Sweet syndrome****Panniculitis/Erythema nodosum***Site:* *lower legs; face, neck, chest, upper extremities* | 1) Ibuprofen 600mg OD2) 7/7 Oral prednisolone 20 mg OD | 1 (100%) survival Stable  |
| Nizery-Guermeur, 2015 | 77, M | RAEB-1 | +35 | **Other/Granulocytic sarcoma***Site: thigh and cheek* | Cloxacillin for 18 days, 1 g 3 times per day / After regression of GS: chemotherapy (3 rounds of cytarabine/mitoxantrone) for MDS | 1 (100%) survival Remission |
| O'Donnell,1995 | 58, F | RAEB | –0.5 | **Vasculitis/Urticarial papules and plaques** *Site: knees (extensor), the heels, hand dorsum* | Prednisolone - Initial improvement in her leg plaques On tapering - developed new plaques on her face. | 0 (0%) survival *Cause of death:* AML 3 months later, died 7 months after vasculitis |
| Palterer,2017 | 78, F | Single lineage dysplasia | 0 | **CTD/Dermatomyositis***Site: Face, eyes, hands* | 1. IV methylprednisolone (1 g/OD) and high-dose IVIG (30 g OD)2. Methotrexate 15 mg/weekly added when corticosteroids were tapered. | 1 (100%) survival NA |
| Papaioannou, 2008 | 78, M | RAEB-2 | +3 | **Other/Generalised skin rush and pruritus***Site: scalp* | Decitabine 20 mg ⁄ m2 ⁄ d i.v. 5 d every 4 wk. - Skin and pruritis regressed after 4 cycles and remission after 2 further cycles | 1 (100%) survival*Partial response* |
| Patsinakidis,2014 | 73, M | Multilineage dysplasia | 0 | **Granulomatous/IGD***Site:* *thighs, lateral aspects of the trunk, both arms* | Topical corticosteroid for skin lesions+ 5-azacytidine for MDS | 1 (100%) survival Remission |
| Peñas,1994 | 85, M | RAEB | –3 | **Other/CTCL, erythroderma***Site:* abdomen, lumbar region, arms, palms and soles | NA | 0 (0%) survival*Cause of death:* Two weeks after admission, the patient died of pneumonia and septic shock |
| Pinal-Fernandez, 2015 | 75, M | RAEB-1 | –24 | **Neutrophilic/Sweet syndrome H****Vasculitis/cutaneous polyarteritis nodosa***Site: anterior and lateral lower extremities* | 1.Prednisone 0.3–0.5 mg/kg/day, azathioprine and cyclophosphamide (poor response)2.azacitidine and corticosteroids (0.2 mg/kg/day) (good response) | 1 (100%) survival Remission |
| Pourmoussa,2017 | 68, M | Unspecified | 0 | **Neutrophilic/Sweet syndrome***Site: bilateral lower extremities* | 1. Broad-spectrum antibiotics, blood products, Prednisone 2. high-dose methylprednisolone | 0 (0%) survival*Cause of death:* MDS evolving into AML  |
| Raj,2007 | 74, M | Multilineage dysplasia | +12 | **Neutrophilic/Sweet syndrome***Site:* scalp, forehead, cheeks, neck; thighs. | 5-azacytidine 75 mg m2 subcutaneously for 7 days every 28 days. | 1 (100%) survival Remission |
| Reina, 2013 | 70, M | RAEB-1 | –0.5 | **Panniculitis/Neutrophilic panniculitis***Site: extremities* | Glucocorticoids 0.5 mg/kg, indomethacin (150 mg/day) and potassium iodide - without improvement. RBC and bone marrow transplant. | 0 (0%) survival*Cause of death:* AML |
| Reuss-Borst,1993 | 56, F | Ring sideroblasts | +24 | **Neutrophilic/Sweet syndrome***Site:* *right thigh and left posterior iliac crest*  |  Cyclophosphamide (2 mg/kg/day). | 1 (100%) survival Remission within 2 weeks |
| Saleh,2017 | 50, F | Multilineage dysplasia | –5 | **Neutrophilic/Pyoderma gangrenosum***Site:* lower left leg circumferentially from ankle to knee. | IV (methylprednisolone and IVIG 5 days followed by oral prednisone 1 mg/kg (mild improvement) | 0 (0%) survival*Cause of death:* Aspiration pneumonia 1 year later  |
| Sargin, 2015 | 54, M | Single lineage dysplasia | 0 | **CTD/Systemic sclerosis***Site: face, fingers, gluteal region* | Metoclopramide, acetylsalicylic acid, methylprednisolone, bosentan, nipedipine, and azathioprine, RBC | 1 (100%) survival NA |
| Schneider,2006 | 68, M | Single lineage dysplasia | –36 | **Others/Lymphoma, pruritic papules andplaques** *Site: chest* | 1. 3-week course of topical steroids 2. Short course of oral prednisolone | 1 (100%) survival Partial remission but relapse 3-4 weeks after discontinuation  |
| Shalaby,2016 | 66, F | unspecified | +12 | **Neutrophilic/Sweet syndrome***Site:* *Cheeks and upper eyelid, L upper extremity; Lower extremities*  | Oral prednisone 90mg OD and dapsone 5% gel. | 1 (100%) survival NA |
| Takagi,1998 | 35, M | RAEB | +58 | **Neutrophilic/PG***Site:* *upper and lower extremities* | Oral prednisolone 40mg | 1 (100%) survival NA |
| Tomasini, 2000 | 68, M | RAEB | +3 | **Neutrophilic/Sweet syndrome***Site: chest, back, upper and lower extremities, face,lip* | Prednisolone (good initially, then unresponsive) Frequent blood transfusions | NAWorsening cytopenia  |
| Tsuji,2003 | 50, M | Unclassifiable | +3 | **CTD/Dermatomyositis***Site:* *face, neck, and forearms* | Oral prednisolone 60 mg per day  | NA |
| Vazquez,2001 | 72, F | Unspecified | +1 | **Other/ 1) Granuloma faciale****Neutrophilic/ 2) Sweet syndrome 3)PG***Site: 1) cheek, forehead, nose 2) back 3) leg* | 2) Prednisone 60 mg OD 3) Dapsone 100mg/day, lowered to 25mg/day, Good response | 1 (100%) survival Remission |
| Vera-Lastra,2021 | 23, F | Unspecified | 0 | **Neutrophilic/Sweet syndrome***Site: upper inner quadrant of Right breast; left thigh* | NA | 0 (0%) survival*Cause of death:* Progressed to AML (subtype M2), MOF  |
| Wang,2018 | 32, M | Single lineage dysplasia | NA | **Neutrophilic/Sweet syndrome***Site: face, trunk and limbs; tip of finger* | Ceftriaxone + levofloxacin + rifampicin + doxycycline for 6 monthsMethylprednisolone 60 mg OD 10 months, weaned to 8mg OD PO  | 1 (100%) survival Remission |
| Watanabe,1992 | 48, F | RAEB-2  | –48 | **Neutrophilic/Sweet syndrome***Site: Extensor aspect of right thigh; left forearm, right knee, and dorsum of left hand; limbs*  | Prednisolone 30mg OD – improved. Weaning dose, discharged after 4 months' hospitalization.Varying doses of prednisolone over 2 years Aspirin to prevent thrombosis. | 0 (0%) survival*Cause of death:* generalised TB (2 years later) |
| Weed,2017 | 72, F | Multilineage dysplasia | +60 | **Granulomatous/paraneoplastic granulomatous dermatosis***Site:* *posterior neck, upper and lower extremities, and abdomen* | EPO (unsuccessful), azacitidine for 3 years (worsening cytopenia)Decitabine for 2 years. | 0 (0%) survival*Cause of death:* sepsis, MOF, lactic acidosis |
| Xiao,2007 | 53, M | Single lineage dysplasia | +132 | **Neutrophilic/Sweet syndrome***Site:* *left eye; bilateral face, neck and back.* | Prednisolone 45 mg OD and amoxycilline/sulbatamol 2.25 g BDWeaning dose prednisolone | 1 (100%) survival Remission |
| Yamamoto, 2001 | 58, M | Single lineage dysplasia | NA | **Other/Annular erythema***Site: back, face, hands* | NA | 0 (0%) survival*Cause of death:* |
| Yang, 2011 | 46, M | RAEB-2 | –3 | **Neutrophilic/Pyoderma gangrenosum***Site: face, inguinal area* | 1. Oral pred 60mg OD + oral dapsone 100mg OD (resolved)2. Amphotericin B, IV ceftriaxone, caspofungin 50mg | 0 (0%) survival*Cause of death:* disseminated invasive aspergillosis, died 35 days after antifungals |
| Yates, 1987 | 54, M | Single lineage dysplasia | +10 | **Neutrophilic/PG***Site: forearm, hand, face, trunk* | IV antibiotics (improved cellulitis, PG worsened) IV hydrocortisone / methyprednisolone and oral prednisolone. | 0 (0%) survival*Cause of death:* AML. Died with pneumocystis pneumonia. |
| Yoneta, 2016 | 80, M | Unspecified | +36  | **Granulomatous/Disseminated granulomatous disease***Site: Head, neck, chest* | 1. Oral etretinate and topical steroids (improved the erythema, papules exacerbated.) 2. Oral tranilast improved) | 0 (0%) survival*Cause of death:* AML, six months after the initiation of tranilast. |
| Yu, 2016 | 89, M | Single lineage dysplasia | NA | **Other/EPDS***Site: R parietal scalp* | Topical 0.1% tacrolimus ointment BD + topical mupirocin ointment  | 1 (100%) survival Remission |
| Case series |  |  |  |  |  |  |
| del Pozo,2005 | 74, F1/2 | Unclassified | *0* | ***Vasculitis/Leukocytoclastic vasculitis; 1*** | Blood transfusionTopical and oral corticosteroid. | 0 (0%) survival*Cause of death:* pneumonia with cardiac and respiratory failure  |
| Jacobs, 1985 | 39, 58, 78, 60, 4M4/6 | RAEB x 1, sideroblast x 1, unspecified x 2 | –2 to +12 | **Neutrophilic/PG: 4** | Prednisolone, RBCs | 0/3, 1 NA (0%) survival*Cause of death: septicaemia (inc 1 x pneumonia)* |
| Kazakov, 2003 | 86, 71, 2M2/3 | 2 unspecified | +7 to +11 | **Others/Nodules, ecchymosis: 2** | 1. Topical CS – partial remission
2. Thalidomide, radiotherapy, surgery – partial remission
 | 0 (0%) survival*Cause of death: dead of disease at 4 – 14 months* |
| Evans, 2002 | 70M, 79M2M2/2 | 2 unspecified | –3 to –12  | **Neutrophilic/Sweet syndrome: 2** | 1. Dapsone 150mg OD (controlled temporarily) / PO cyclophosphamdie 50mg OD more effective
2. Topical clobetasol propionate, pred daily
 | 2 (100%) survival*Remission* |
| Luherne, 2021 | 1/270F | Single lineage | –3 | **Granulomatous/Disseminated cutaneous granulomatosis: 1** | Systemic steroids (10 mg/day) (rapid resolution) Methotrexate (7.5 mg/week) Erythropoietin for anaemia | 0 (0%) survival*Cause of death: infectious complications 3 years later*  |
| Morioka, 1990 | 2/250M, 48F | RA, RAEB | –24 to +5 | **Neutrophilic/Sweet syndrome: 2** | GCS-FPrednisolone | 0 (0%) survival*Cause of death:* *1.* *Developed AML 2.5 months later, died of SAH* *2.TB* |
| Qian, 2015 | 2/235M 46M2M | 2 Multilineage dysplasia | 0 | **Panniculitis/** **Neutrophilic panniculitis: 2** | Methylprednisolone (1 mg/kg) | 2 (100%) survival*Good response* |
| Billstrom, 1995 | 6/824M2F65, 60, 66, 71, 55 | 3 RA, 3 RAEB | 0 to +20 | **Neutrophilic/Sweet syndrome: 1****Vasculitis/Vasculitis: 4****Panniculitis/Panniculitis: 1** | NA | NA |
| Billings, 2004 | 2/280M 75M2M | unspecified | +36 | **Neutrophilic/Sweet syndrome: 2** | NA | NA |
| Hamada, 2008 | 4/433M 50M, 31M, 23F3M 1F | 3 RA, 1ringed sideroblasts | NA | **Neutrophilic/neutrophilic dermatosis: 3****Other/Chronic pyoderma glutaele: 1** | NA | NA |
| Pagliuca, 1990 | 2/443, 251M 1F | RA, RAEB | 0 to +120 | **Vasculitis/Vasculitis: 2** | High dose steroids | 2 (100%) survival*Some improvement* |
| Shimizu, 2016 | 5/2393M 2F | unspecified | NA | **Panniculitis/erythema nodosum: 1****Neutrophilic/Sweet syndrome: 2****2 not mentioned** | NA | 4 (80%) survival*Cause of death: 1 x unidentified cause* |
| Vestey, 1993 | 2/22M66, 71 | 1 unspecified 1 RAEB-1 | –3.5 to –4 | **Granulomatous/granuloma annulare: 2** | Chemotherapy (*doxorubicin, cytosine, arabinoside and thioguanine)* x 1 (after AML) | 2 (100%) survival1 x developedAML but achieved remission post chemotherapy |
| Weenig, 2004 | 1/462F | RAEB | NA | **Neutrophilic/Sweet syndrome: 1** | Prednisolone (improved) | 0 (0%) survival*Cause of death: no information* |
| Horiguchi, 1998 | 3M45-82 | 2 RA | 0 | **Neutrophilic/Sweet syndrome: 2** | Prednisolone 5-10mg OD and potassium iodide 900mg ODBethamethasone | 3 (100%) survival*Improvement in skin* |
| Vignon-Pennamen, 1991 | 1/7661F | 1 unspecified | NA | **Neutrophilic/Sweet syndrome: 1**  | Topical steroids and prednisolone  | 1 (100%) survivalGood response |
| Ghoufi, 2016 | 8/62Gender NA | 8 unspecified | NA | **Neutrophilic/Sweet syndrome H: 7, N: 1**  | High potent topical steroids and/or systemic steroids, hydroxychloroquine colchicine, thalidomide , dapsone, NSAID, intravenous immunoglobulins with poor efficacy. | 7 (87.5%) survival H-SS 1 (12.5%) death N-SS*Cause of death: 8 months after the diagnosis of H-SS and 2 years after onset of hematological disease* |
| Farah, 2010 | 10/15711M 4F | NA | NA | **Neutrophilic/Sweet syndrome: 7****Vasculitis/Leukocytoclastic vasculitis: 2****Vasculitis/Behçet's disease: 1** | NA | *Cause of death:* *3/7 death in Sweet Syndrome:* *2 x 4-20 months after AML transformation**1 x 36 months after without transformation* |
| Green, 1990 | 5/671, 72, 64, 63, 734M, 1F | RAEB x 2, RARS, RAEB, RA | NA | **Vasculitis/cutaneous vasculitis: 5** | Corticosteroid | NA |
| Pragliuca, 1990 | 2/443, 251M 1F | RAEB 1Single lineage 1 | 0 to +120 | **Vasculitis/Vasculitis: 2** | Steroid | 1 (50%) survivalCause of death: Multi-organ failure |
| Snyder, 2018 | 2/250, 732M | Single lineage 1 Unspecified 1 | –1 to –48 | **Neutrophilic/Sweet syndrome H:** 2 | Azacytidine, prednisolone | 1 (50%) survival1 x hospice care with MOF1 under monitoring |

CTCL, cutaneous T cell lymphoma. G-CSF, Granulocyte colony-stimulating factor; H-SS, histiocytoid Sweet syndrome, IGD, interstitial granulomatous dermatitiw; IVIG, intravenous immunoglobulin; MOF, multiorgan failure; N-SS, neutrophilic Sweet syndrome; PG, pyoderma gangrenosum; RA, refractory anaemia; RARS, refractory anaemia with ring sideroblasts; RAEB, refractory anaemia with excess blasts; RAEB-1, refractory anaemia with excess blasts-1; RAEB-2, refractory anaemia with excess blasts-2; SAH, subarachnoid haemorrhage.

aOnset – in relation to MDS diagnosis

**Appedendix S1.** References of included studies

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