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| Study | Population | Target attainment | Efficacy | Safety |
| Round et al 2021[8] | 96 serum samples from 77 neonates | II: *Target 10-15 mg/L*  Subtherapeutic: 40%  Therapeutic:44%  Supratherapeutic: 15%  CI-step1: *Target 15-25 mg/L*  Subtherapeutic: 31%  Therapeutic:56%  Supratherapeutic: 13 %    CI-step2: *Target 15-25 mg/L*  Subtherapeutic: 25  Therapeutic:69 %  Supratherapeutic: 5 %  Time taken to achieve target:  II: 51 h (12–166) c  CI-step1: 22.5 h (12–69) c  CI-step2: 24 h (14–108) c | NA | No complication  Difference in creatinine level refers to the baseline creatinine minus highest creatinine while on vancomycin (μmol/L). differences in creatinine levels  II: 1 (−6 to 39) a  CI step 1: 3 (-31 to 45) a  CI step 2: 0 (-50 to 60) a |
| Tauzin et al  2019[13] | 75 neonates 184 serum samples | *Target 20-30 mg/L*  Subtherapeutic: 43.9%  Therapeutic: 30.8 % Supratherapeutic: 25.3% | NA | NA |
| Zhao et al 2013  [9] | 116 neonates | *Target 15-25 mg/L*  Subtherapeutic: 30.2%  Therapeutic: 41.4 % Supratherapeutic: 28.4% | NA | NA |
| Plan et al 2008 [19] | 145 neonates (73 in period 1 and 72 in period 2) | *Target 10-25 mg/L*  Period 1  Subtherapeutic: 24%  Therapeutic: 74 % Supratherapeutic: 1.4%  Period 2  Subtherapeutic: 5%  Therapeutic: 75 % Supratherapeutic: 19% | At H48, 71% (57/ 80) of neonates with proved CoNS infection recovered.  Bacteriological efficacy was similar with the two dosing levels as 69% (27/39) and 73% (30/41) in groups 1 and 2 (p,0.05),  At H96, blood culture remained positive in only 17% (4/23) of patients.  Finally, 4 days after the onset of antibiotics, negative blood cultures were observed in most cases (76/82, 93%). | NA |
| Oudin et al 2011 [4] | 68 neonates  151 serum samples | *Target 10-20 mg/L*  Subtherapeutic: 5.8%  Therapeutic: 89.2 % Supratherapeutic: 5% | NA | Serum creatinine variations −7 (20) d μmol/l and −10 (12) d μmol/l from the beginning to the end of treatment among patients with 7 or more days of treatment.  2 patients increase in creatinine concentration at the end of the treatment: septic shock + vancomycine overdose. Recovered after 3 weeks. |
| Demirel et al 2015 [20] | 173 serum sample of 77 preterm neonates | *Target 15-20 mg/L*  At 48h of infusion (p=0.002)   * Group I (II):   Subtherapeutic: 26.8 % Therapeutic:34.1%  Supratherapeutic: 39 %   * Group II (CI):   Subtherapeutic:41.7 %  Therapeutic: 52.8% Supratherapeutic: 5.6 %  At the end of infusion (p=0.09)   * Group I (II):   Subtherapeutic: 7.3 %  Therapeutic: 78 %  Supratherapeutic: 14.6 %   * Group II (CI):   Subtherapeutic:16.8 %  Therapeutic: 80.6% Supratherapeutic: 2.8 %  Dose adjustement (n) (p=0.2)   * Group I: 27 (65.9%) * GroupII: 19 (52.8%) | No differences between the 2 groups for Töllner score  Comparison of pathogen microorganisms: all control culture results were negative in the 2 groups | None of the patients had nephrotoxicity  Delta Creatinine (μmol/L):  group I: –0.1 (–0.3/–0.05) c  group II: –0.15 (–0.4/–0.05) c |
| Pawlotsky et al 1998 [5] | 53 neonates  24 in group 1  29 in group 2 | *Target 10-30 mg/L*  Group 1 % in the target 56%  Group 2 % in the target 88% | 25.5% had documented sepsis  All recovered | No side effects  No hypotension or red man syndrome  1 case of reversible increase in creatinine during klebsiella sepsis |
| Gomez et al [23] | Before: 45 neonates, 60 serum samples  After: 49 neonates, 59 serum samples | *Target 15-25 mg/L*  Initial exposure:   * Before:   Subtherapeutic: 68.3 % Therapeutic:28.3%  Supratherapeutic: 3.3 %   * After:   Subtherapeutic: 10.2 % Therapeutic:74.6%  Supratherapeutic: 15.3 %  All exposure:   * Before   Subtherapeutic: 67.2 % Therapeutic:31%  Supratherapeutic: 1.7 %   * After:   Subtherapeutic: 12.6 % Therapeutic:74.8%  Supratherapeutic: 12.6 % | Time to blood culture negativation: (p<0.001)  Group before:  54.6 h (48.9–107) b (n = 31)  Group after:  37.5 h (28.1–53.6) b (n = 22)  Differences concerning leukomalacia: (p=0.021)  group before: 22.6%  group after: 2.9 %  No differences between the 2 groups for: Relapse, Decrease of inflammatory syndrome, increased respiratory support, Duration of vasoactive drugs use , Catheter removal, Severe bronchopulmonary dysplasia , Total duration of hospitalization | Only one patient showed nephrotoxicity in the before group, and two in the after group (not significant) |
| Kim et al [14] | 50 neonates  58 serum samples | CI highest probability (28 to 32% of patients) of attaining Css (15 - 20 mg/l) with: loading dose = 10 mg/kg followed by a maintenance dose = 25 to 30 mg/kg/24 h  Nomogram proposed depending on the targeted concentration. | NA | NA |
| Gwee et al 2019 [10] | 111 neonates | *Target 15-25 mg/L*  II: % in the target 41%  GA 36-44 w: 44%  GA 29-35 w: 42%  GA <29 w: 20%  CI % in the target 85%  Creat < 40 μmol/L = 80%  Creat < 40μmol/L + GA >=40 w = 80%  Creat > 60 μmol = 100%  40<Creat <60 μmol = 100%   * Time to achieve target (p=0.003)   II:33.6 h (38.8)  c  CI 27.1h (10.8) c   * Number of dose adjustments (p=0.001)   II1 (0-3) c  CI 0 (0-1) c | Times to the clearance of bacteremia: (P = .62)  II: 55.3 h (14.9) d CI 46.1 h (10.3) d | no increase in the creatinine levels at the end compared to the start of therapy in the II group (35.4–31.2 μmol/L; SD 19.6–16.2 μmol/L; P = .01) or in the CI group (29.3–28.1 μmol/L; SD 12.1–10.7 μmol/L; P = .50). |
| Leroux et al 2016 [11] | 190 neonates | *Target 15-25 mg/L*  % in the target 72%  <10 mg/L: 3.1 %  >30 mg/L: 6.3 % | NA | 2 patients had nephrotoxicity |
| Ponthier et al 2022 [15] | 1900 PK profiles simulated.  External evaluation 82 neonates | *Target AUC0-24 400-600 mg\*h/L*  % in the target in simulated set: 46.9%  % in the target in external set 35.3% | NA | NA |
| Patel et al [16] | 120 serum samples  Number of patients not reported  82 samples | *Target 15-25 mg/L*  % in the target 77%  % below the target 4% | NA | Creat: 39 μmol/L (20) d at the start of the treatment and to 28 μmol/L (10) d at the end.  Two patients who developed renal failure secondary to a decline in clinical status. |
| Germovsek et al  2019 [12] | 54 infants for the model development: 31infants/ 102 concentrations for CI and 23 infants with 81 concentrations II.  54 infants for the model evaluation: 25 infants/ 84 concentrations for CI and 9 infants with 23 concentrations II. | Almost all simulations either CI or II reached the target (AUC24,ss/MIC of 400)  AUC24,ss/MIC:  CI= 467 mg\*h/L (210-1084) f  II= 531 mg\*h/L (214-1186) f  GA <25 weeks and postnatal age <2 weeks:  CI: AUC24,ss/MIC 663 mg\*h/L (246–1401) e  II: AUC24,ss/MIC 482 mg\*h/L (322–783) e  GA <25 weeks and postnatal age <2 weeks:  No loading dose or loading dose <15 mg/kg: lower exposure 663 mg\*h/L (246–1401) e compared to loading dose of 15 mg/kg 791 mg\*h/L (379–1445) e) | NA | 4 infants (5.2%) developed acute kidney injury on vancomycin.  3 of them had a stage 1 injury (serum creatinine rise 1.5 to 1.9 times baseline levels) and one had a stage 3 injury (serum creatinine rise 2.0 to 2.9 times baseline levels) based on neonatal KDIGO classification.  Serum creatinine at the start of therapy  Model development  31.0 (18–98) c  Model validation  34.0 (15–77) c  Peak serum creatinine during therapy  Model development  27.0 (18–83) c  Model validation  29.0 (18–162) c |
| Cousin et al 2022 [18] | 52 neonates | *Target 20-25 mg/L*  Subtherapeutic: 58.6 % Therapeutic:37.1%  Supratherapeutic(>30mg/L): 4.3 % | 6 patients died (6/52, 11.5%)  14 episodes of infection = treatment failure:  C24h < 20 mg/l in 10/14 (71.4%)  NS gram positive vs. no germ identified (*p* = 0.37) | Oliguria occurred in 5 episodes of infection:  2 had a C24h < 20 mg/L  3 had C24h ≥ 20 mg/L (*p* = 0.64).  NS in plasma creatinine (*p* = 0.36) after 24 h of vancomycin treatment. |

Legends: CI: continuous infusion of vancomycin; Creat: creatinine; d: days; g: grams; GA: gestational Age; h: hours; II: intermittent infusion of vancomycin; NS: not significant; PMA: post menstrual age; PNA: post natal age; SS: steady-state; TDM: therapeutic drug monitoring; w: weeks

a mean(range)

b median(interquartile)

c median(range)

d mean (sd)

e median (IC95)

f mean (95CI)